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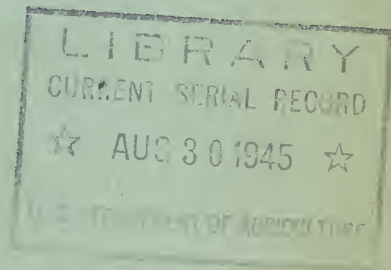
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UNITED STATES DEPARTMENT OF AGRICULTURE

*Graduate School
Bulletin*

FALL SEMESTER 1944-45



*Graduate and Undergraduate
Continuation Study for Federal Employees*

WASHINGTON ~ AUGUST, 1944

This Bulletin covers graduate and undergraduate programs for the Fall Semester only. A new Bulletin will be issued for the Spring Semester. A special Graduate Bulletin concerned with graduate programs only is available on request. A special Bulletin on correspondence study is likewise available.

Fall Semester begins September 25

Calendar for Fall Semester

September 25, Monday—Fall Semester begins

September 25 to 29—All classes begin unless other date is given in this Bulletin

October 7, Saturday—End of refund period and last day of registration without payment of extra fee

November 30, Thursday—No classes; Thanksgiving holiday

December 23, Saturday—Christmas holidays begin

January 8, Monday—Classes resume after holidays

January 19, Friday—Close of Fall Semester *

All classes begin between September 25 and 29

* Classes which have missed sessions (e.g., because of Thanksgiving holiday) will continue until deficiency is made up.

Business Office—Room 1031, South Agriculture Building
Between 12th and 14th on Independence Avenue, SW.
Hours—9:00 A.M. to 6:20 P.M. (1 P.M. Saturday)
Telephone—Republic 4142, Extension 6337

UNITED STATES DEPARTMENT OF AGRICULTURE

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FALL SEMESTER 1944-45



*Graduate and Undergraduate
Continuation Study for Federal Employees*

WASHINGTON ~ AUGUST, 1944

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* Deceased.

** On leave 1944-45.

General Information

ORIGIN AND PURPOSE

THE GRADUATE SCHOOL, a self-supporting, non-profit institution, has as its chief purpose the stimulation and encouragement of education for Federal employees after they enter Government work. Established in 1921 by Secretary Henry C. Wallace, primarily to furnish opportunities for the education and training of employees in the Department of Agriculture, the institution now offers courses which are open to all Federal employees.

In fulfillment of its original purpose, the School now presents a rich and varied curriculum ranging from the comparatively elementary to advanced study on the purely graduate level. Representatives of every important agency of the Federal Government were among the more than 5000 persons who enrolled for instruction in 1943-44.

In the course of almost a quarter-century of experience in meeting changing educational needs of Federal employees, the School has grown into a unique educational institution. It is, in effect, (1) a graduate school, (2) an in-service training institute, and (3) an adult education organization. These functions are implicit in the original objectives prescribed for the School:

1. To supplement in-service training programs, conducted on government time and at government expense, by making it possible for employees to train themselves both intensively and extensively for proficiency in their present positions and for advancement to better positions.
2. To make available to career employees the opportunity to advance educationally, continuously and progressively, as they advance in job proficiency and responsibility.
3. To provide graduate education acceptable in graduate institutions for the convenience of employees who desire advanced degrees but find it difficult, both for personal and official reasons, to complete all study in residence at the degree-granting institution.
4. To provide certain cultural, creative, and leisure-time opportunities for employees.
5. To assure the attainment of these objectives by making available to employees the experience, knowledge, and instructional talent of outstanding specialists in the Federal service.¹

In making these objectives effective, the emphasis of the School is on functional education. Dedicated to meeting the actual needs of employees, the School centers its attention on the human element—teachers and students—in the educational process. Methods,

¹ United States Department of Agriculture "Regulations Governing the Graduate School Promulgated Pursuant to the Authority Contained in the Act of April 12, 1892, and the Deficiency Act of March 3, 1901 (20 U.S.C. Sec. 91)."

organization, physical facilities and related factors are secondary in importance. The entire program of the School is based on the belief that work and study can be combined to mutual advantage. The School also operates in the conviction that, inasmuch as after-work activities and off-the-job environment have a vital relation to morale and performance on the job, the public interest is served by providing Federal employees with broad opportunities for continuation study along the lines of their *general* interests as *individuals* as well as their *special* interests as *employees*. Courses, as a result, range from the cultural to the vocational, without exclusive emphasis on either.

AUTHORITY

Congress has authorized the use of Government facilities for study and research by qualified individuals, students, and graduates of institutions of learning in the several states and in the District of Columbia under rules and regulations set up by the heads of departments and bureau chiefs. It was under this authority, combined with the provisions of the organic act of the Department, that the Graduate School was organized.² A summary of the regulations governing the Graduate School was issued by the Department February 9, 1943.

ADMINISTRATION

The government of the School is vested in a General Administration Board appointed by the Secretary of Agriculture. The School is administered by a Director, appointed by the Board, with the assistance of a small staff. Eight committees named by the Board, one for each major division of the School, advise the administration concerning educational matters in their respective fields. Neither board members nor committees receive compensation. The School receives no Federal funds. Its operating expenses, reduced to a minimum by the use of Government buildings and facilities, are paid entirely from small course fees.

ROLE IN THE DEPARTMENT

Its extensive contribution to morale and competence among employees of the Department of Agriculture and other Federal agencies is the chief justification for the Graduate School. It promotes forward-looking personnel administration by offering ambitious employees numerous opportunities to prepare themselves for more efficient public service. Among other things, the School offers avenues of advancement for employees to rise above blind-alley jobs by

² (Joint Res. April 12, 1892, 27 Stat. 395; Deficiency Act of March 3, 1901, 31 Stat. 1010, 1039.)

preparing themselves adequately for promotion to more significant positions. By presenting facilities of escape from routine to broader cultural interests through creative achievement after work hours, the School challenges the development of the employee's intellectual faculties to keep abreast of his whole field of knowledge, when the daily job may require only a minor portion of this information. This broader outlook increases the employee's understanding of his own special duties and their relation to larger and more general programs of action. Finally, the School presents a unique opportunity for young professional men to gain the most fruitful educational experience which comes from personal, non-official contacts with older workers who have rich backgrounds in their respective specialties. The recognition of the value of the School to the personnel work of the Department is shown by a Secretarial memorandum which names the Director of Personnel as *ex officio* Chairman of the General Administration Board of the School.

The School supplements Departmental in-service training programs, elaborates upon them, and carries on from where they end. Training conducted on Government time is likely to be confined to immediate needs, to knowledge and skills which will give reasonably definite direct returns to the Government. The Graduate School offers a no less vital service to the Government, although the results may be more indirect and intangible. The School opens avenues for long-run advancement which training officers, for financial and other reasons, are unable to offer at Government expense. In-service training programs emphasize primarily, if not exclusively, the training needs of management, while the Graduate School meets the needs of employees, many of whom wish to prepare themselves for professional promotions beyond the interests and jurisdiction of the training offered in the agencies in which the employees are working.

LECTURES AND PUBLICATIONS

At least one lecture series dealing with a major current problem is offered each year. The detailed program for 1944-45 will be announced. Several of the lectures of previous years, and a few other valuable works, are available as Graduate School publications. (See list on inside back cover.)

COUNSELING SERVICES

To aid students in planning their education and training, a panel of Departmental Educational Counselors has been designated by the Department of Agriculture in their major fields of study.

These persons, outstanding in their respective fields, serve also as members of the departmental committees of the Graduate School and may be consulted by students from outside the Department of Agriculture. They are always available for consultation on educational plans, whether to be pursued in the Graduate School or in other institutions. A list of these Counselors may be obtained from the Graduate School.

Each bureau and office of the Department of Agriculture has designated an educational counselor to advise with its own employees. The names of these counselors may be secured from the bureau or office in question; field employees may address their educational counselors in care of their organizations.

FACULTY

The Graduate School faculty is composed almost entirely of persons in the Federal service, a source of talent and expertness unexcelled anywhere in the nation. Professional competence is the sole criterion of selection. Faculty members combine excellent academic training, college-teaching experience, and daily practice in the application of the subject matter taught. The only exception to this pattern of qualifications is found in a few cases obviously requiring greater emphasis on technical experience than on academic background. (See Faculty section at back.)

CERTIFIED STATEMENTS OF ACCOMPLISHMENT

In three fields—statistics, public administration, and accounting—the Graduate School offers Certified Statements of Accomplishment upon the student's completion of a specified program of study. (For complete details see the Departments of Public Administration and Mathematics and Statistics). These Statements are offered to encourage the student to complete a well-rounded approach to his chosen field of study and work, so that he may more competently discharge his present and prospective responsibilities as a public servant.

LIBRARY FACILITIES

The Department of Agriculture Library, containing approximately half a million books, is open to Graduate School students from 8:30 a. m. to 8:30 p. m. Through that Library, the School also has ready and convenient access to unexcelled special libraries.

LIBRARY ASSISTANTSHIPS

A limited number of library assistantships are open to qualified students from the Department of Agriculture who wish to use this

method of paying their fees. All work is done after official hours. Students interested should inquire at the School Office.

FELLOWS AND INTERNS

Each year the Department of Agriculture, in cooperation with the Department of State and the Office of Inter-American Affairs, provides to some sixty or eighty representatives of the other American republics graduate fellowship opportunities for study, observation, and training in the United States. The program is designed to provide additional training for serious, competent scientists and professional men in the improvement of agriculture and living conditions in the Americas. Its aim is to develop public-minded leaders who are able to carry full public and professional responsibilities. The Graduate School cooperates in this undertaking by granting honorary graduate fellowships to all of these students from the other American republics. The School also participates in the Departmental committee that formulates the general programs for this group.

The National Institute of Public Affairs works with colleges and universities and with Federal agencies in Washington in providing annually an internship program for a group of college graduates, competitively selected from the country at large. The Department of Agriculture for several years has cooperated in this undertaking by furnishing selected training and internship opportunities for trainees from the Institute. The Graduate School cooperates by granting to such interns, whether in the Department of Agriculture or in other Federal agencies, graduate fellowships for study in the School.

CORRESPONDENCE WORK

The Graduate School offers a limited number of correspondence courses intended primarily for the benefit of field employees of the Department of Agriculture. Other Federal Government employees are admitted as staff and facilities permit. Plans are in progress for expansion of this type of education. Persons who are interested may write the School for special announcements covering correspondence study.

REGISTRATION REGULATIONS

Opening Date. The twenty-third year of the Graduate School opens on Monday, September 25, 1944. All classes begin during the week starting on that date. The fall and spring semesters each run fifteen weeks.

Admission. Admission to courses in the Graduate School is open to all qualified employees in the Federal service, and to such other qualified individuals as facilities will permit. Admission to correspondence courses is open only to Federal employees.

Planning Your Program. During the period from September 20 to September 30 (from 5:30 to 6:30 p. m.) representatives of the major departments of the School will be available for consultation on courses and programs of study. At other times members of the School staff will be glad to provide assistance.

Registration. Registration should be made at the earliest opportunity in Room 1031, South Building, Department of Agriculture. After Saturday, October 7, students may enroll for credit only with the approval of the instructor and the Director. Mail registration forms will be supplied on request. Registration is not completed until the required fees have been paid. When the limitation set for each course is reached, registration for that course is closed. The Graduate School reserves the right to cancel any course if registration does not warrant continuance.

Late Registration Fee. Students who register after October 7 must pay a late registration fee of \$1.00 a course. This does not apply to persons who submit evidence that official Government action prevented their registration prior to that date.

Fees. The fee for each course is indicated in the course description. Unless otherwise stated, fees are computed at the rate of \$6.00 a credit hour for undergraduate courses, and \$7.00 a credit hour for graduate and the most advanced undergraduate courses. The fee for auditing a course is the same as that charged for credit.

Partial Payment Plan. Arrangements may be made at the time of registration for payment in two installments, for which there will be an additional service charge of \$1.00 for each course. The first installment of not less than half the full fee, plus the \$1.00 service charge, must be paid at the time of registration. The second and final installment must be paid on or before November 11. Failure to pay will result in automatic suspension from the course.

Refunds. Students withdrawing from classes will not be entitled to refund except that—

1. When a student is granted permission to withdraw from a course on or before October 7, his fee, minus a \$3.00 registration charge, will be refunded.
2. When a student is OFFICIALLY transferred out of the Washington area or leaves Washington to enter the armed forces, his fee, minus a \$3.00 registration charge for each course, will be refunded in the amount pro-

portionate to the unexpired portion of the semester, provided written evidence of such transfer or induction is presented. This does not apply to cases arising out of the student's voluntary action.

All adjustments are made as of the date on which application for refund is received.

Room Schedules. Room schedules for classes will be posted after September 20 on bulletin boards outside Room 1031, and in the north entrances of the fourth and seventh wings of the South Building.

Residence Credit at American University. Students planning to enroll in cooperative courses, offered at the Graduate School, for residence credit towards an advanced degree at American University must work out their programs in advance with the Dean of the Graduate Division, American University, and must file with the registrar of that institution a transcript of previous academic work.

CREDIT AND CERTIFICATION

Academic Credit. Persons registering for academic credit must satisfy all prerequisites for admission to the course, as specified in the course description.

Students who wish to transfer graduate or undergraduate credit to a college or university or to the United States Civil Service Commission must file with the Graduate School an official record indicating a bachelor's degree (for courses carrying graduate credit), or satisfactory completion of at least fifteen units of high school work (for courses carrying undergraduate credit). Such records become the property of the Graduate School. Graduate students should arrange their programs in advance through the dean of the graduate school of the institution from which the degree is contemplated. The latest catalogs of colleges and universities are available for examination in the Department of Agriculture Library.

The United States Civil Service Commission accepts Graduate School credits, the same as those from recognized colleges and universities, for examination and qualification purposes. Although courses are of standard graduate and undergraduate grade for the levels indicated (with the exception of a few non-credit courses given to meet special training needs of Federal employees), the School does not grant degrees and has never sought that authority. It prefers to cooperate with existing institutions having that function. Students who wish credit transferred must, of course, meet in all particulars the requirements of the institution to which cred-

its are to be sent. These may, in accordance with growing practice, sometimes call for qualifying examinations for advanced credit. However, certifications of Graduate School work have been accepted for the past twenty-three years by many of the leading colleges and universities. Because of the peculiar conditions under which the School operates, it has never asked, and never felt it necessary to ask, to be included on the lists of accrediting associations. For acceptance of its credits, it relies on the merits of its courses and on the caliber and well-known competence of its instructors. Methods, grades, and credits are without significance unless they result in demonstrated knowledge, skills, and attitudes and in real ability to make effective application. Course requirements and examinations for credit are planned accordingly.

Cooperation with American University. The Graduate School of the Department of Agriculture and the Graduate Division of the School of Social Sciences and Public Affairs of American University have found it mutually advantageous to cooperate in portions of their graduate programs. Certain courses in each school which supplement courses in the other are offered cooperatively. Courses in this announcement preceded by an asterisk may be applied as residence credit towards an advanced degree at American University.

Audit. A student registering as an auditor receives full privileges of class participation if he chooses to exercise them. He does not receive a grade; he receives only a mark of AUD. He is not expected to take examinations and is not held responsible in any other way for meeting standards expected of credit students.

Grades. Students registering for credit will receive written notice by mail of grades received. Students should keep the School office informed of changes of address.

Certification of Record. Upon a student's written request, an official certification bearing the seal of the Graduate School will be sent to him or to an organization designated by him. The fee for this service is 50 cents a copy prepaid. (Note: Students who desire a certification of work done prior to the academic year 1941-42 must comply with certification rules in effect at the time the student was enrolled.) Certification of record for academic credit to be transferred to a college or university will not be made unless the student has filed with the Graduate School a transcript of his previous academic work. (See Academic Credit above.)

Department of Biological Sciences

DEPARTMENTAL COMMITTEE

- HOWARD P. BARSS, M.S., Principal Botanist and Experiment Station Administrator, Office of Experiment Stations (Chairman)
F. C. BISHOPP, Ph.D., Assistant Chief, Bureau of Entomology and Plant Quarantine
M. A. McCALL, Ph.D., Assistant Chief, Bureau of Plant Industry, Soils, and Agricultural Engineering
BENJAMIN SCHWARTZ, Ph.D., Chief, Zoological Division, Bureau of Animal Industry
H. L. SHANTZ, Ph.D., Former Chief, Division of Wildlife Management, Forest Service (retired)

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Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figures in parenthesis following the course title indicate number of semester credits.

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209. Systematic Botany (2 each semester)

M 6-8. \$12

SIDNEY F. BLAKE

Intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester is devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

207. Land Management Ecology (3)

Tu-Th 6-7:30. \$18

EDWARD H. GRAHAM

Treats the biological principles applicable to major types of land management. Emphasis is placed upon those elements of both plant and animal ecology which apply to the use of land resources—soil, crops, range, forests, inland waters, and wildlife. Primarily lecture work, with a variety of illustrative material, but a few local field trips are taken, weather and other conditions permitting. Original sources are used in large part, although Graham's *Natural Principles of Land Use* serves as a general text. The course is designed especially for those without extensive biological training who are interested in obtaining an ecological approach to forestry, range management, wildlife management, soil conservation, and general techniques of land use.

559. Medical and Veterinary Entomology (2 each semester)

M 6-8. \$14

F. C. BISHOPP

A timely general course in medical entomology with emphasis on the practical aspects of this important field. The biology, habits, and relation to disease of insects, spiders, mites, and ticks, are discussed. How these arthropods affect man and animals as intermediate hosts, or carriers of disease-producing organisms, is given attention and special consideration is given methods of control. The adaptation of known control procedures to present-day defense problems is considered. Features of the course include lectures by outstanding specialists in this general field and round-table discussions of practical problems.

Prerequisite: Basic training in biology or consent of instructor.

564. Genetics (2 each semester)

M 6-8. \$14

TAGE U. H. ELLINGER

A survey course on the broadest biological basis, covering the mechanisms of the transmission of hereditary characteristics (cyto-genetics), gene action in development (physiological genetics and phases of experimental embryology), and population genetics (including the evolutionary aspects). Lectures and discussion. The course is designed for students who have not had a specialized course in genetics and for advanced students who desire a review of the whole field.

784. Genetics Seminar (2 each semester)

M 8-10. \$14

TAGE U. H. ELLINGER

The seminar course will be based principally on outstanding contributions that have marked great advances in the theory and application of genetics. Reading assignments, student reports, discussion. In the selection of the material to be reviewed, consideration will be given to the special interests or professional requirements of the individual students. In 1944-45 much attention will be given to the great naturalists, the biometric school, and the genotype-phenotype axiom.

This and the preceding course (564) will be so conducted that students may profit by attending both.

[206.] Useful Plants of the American Tropics

F. RAYMOND FOSBERG

[554.] Advanced Plant Ecology

M. B. WAITE

[555.] Plant Physiology

GLENN A. GREATHOUSE

[556.] Plant Biophysics

GLENN A. GREATHOUSE

Introduction to Experimental Design*(See Mathematics and Statistics [126])*

A. E. BRANDT

Soil Fertility*(See Physical Sciences 157)*

J. K. ABLEITER

Comparative World Agriculture*(See Social Sciences 581)*

CLAYTON E. WHIPPLE

Production Economics*(See Social Sciences 824)*

[] Not given 1944-45.

Department of Engineering and Mechanical Arts

DEPARTMENTAL COMMITTEE

FRANCIS J. SETTE, M.S., Deputy Director, Transportation and Storage, Division of Stock Piling and Transportation, War Production Board (Chairman)
R. G. HAINSWORTH, M.A., Economic Geographer, Office of Foreign Agricultural Relations
ROBERT W. TRULLINGER, B.S., Assistant Chief, Office of Experiment Stations
FAYETTE S. WARNER, Ph.D., Engineer-Economist, Federal Power Commission
MARSHALL S. WRIGHT, Principal Cartographic Engineer, Office of the Secretary, USDA

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Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figures in parenthesis following the course title indicate number of semester credits.

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PHOTOGRAPHY

192. Basic Photography (2)

M 6-8. \$12

CARL H. HANSON and SPECIALISTS

This is a lecture-demonstration course, elementary and basic in character, designed to meet the needs of the amateur. Nearly all lectures are fully illustrated with slides, supplemented by other illustrative material. Demonstrations are given when feasible. No laboratory work, but individual guidance will be freely given students who can and will arrange to do practice work. Results of practice work may be submitted for criticism.

Topics covered: elementary photographic optics, films, and plates, the use of cameras and lenses, exposure, composition, darkroom conveniences and technique, developers and development, the technique of negative making, the theory and practice of making contact and projection prints, outdoor and indoor photography, child photography, filters and their use, lighting and posing in portraiture, home portraiture, Kodachrome photography.

A list of the textbooks used in this course may be obtained from the Graduate School Office.

193. Applied Photography (2)

M 6-8. \$12. Repeated in Spring

ELBRIDGE C. PURDY

This is a laboratory course which enables the students who have taken Basic Photography (Course 192 above) or equivalent to *apply* theory and principles in the studio and laboratory. Individual guidance will be given students. The results of the work will be analyzed. Topics covered: films and plates, use of cameras and lenses, exposure, composition, darkroom techniques, developers and development, theory and practice of making contact and projection prints, outdoor and indoor photography, filters and their use, lighting and posing in portraiture, and color photography.

Prerequisite: Basic Photography or equivalent.

ENGINEERING

- [175.] **Naval Architecture** (2 each semester)
C. L. WRIGHT
- [176.] **Ship Construction** (2 each semester)
C. L. WRIGHT
- [177.] **Aerodynamics** (2 each semester)
W. E. KONECZNY
- [178.] **Airplane Stress Analysis** (2 each semester)
W. E. KONECZNY
- [179.] **Aircraft Power Plants**
- Electric Utility Engineering**
(See Utility Administration 857)
- Advanced Physical Metallurgy**
(See Physical Sciences 526)
- Engineering Alloys**
(See Physical Sciences 540)

GRAPHIC PRESENTATION

- 180. Basic Mechanical Drawing** (2)
Tu-Th 6-8. \$20
GEORGE L. EDICK
Problems in conventional presentation of objects by means of lines, including geometrical problems, orthographic projection, intersections, developments, dimensioning and lettering. Prerequisite to the courses in architectural and mechanical drafting.
- 181. Architectural Drafting** (2) Spring
GEORGE L. EDICK
- 182. Mechanical Drafting** (2) Spring
GEORGE L. EDICK
- [183.] **Surveying**
E. J. SCHLATTER
- [184.] **Aerial Photogrammetry**
REYNOLD E. ASK
- 185. Pencil Sketching and Freehand Drawing** (2)
M-W 6-8. \$15. Repeated in Spring
WALTER G. CADMUS
A study of shade, shadows, and perspective. An intensive study of theory, harmony of lines, and pictorial and outdoor sketching. Each student receives individual criticism. Open to both beginners and advanced students. Sketching only, two hours a week; Wed. (1 hr. cr.) from 6 to 8; fee \$10.

[] Not given 1944-45.

186. Interior Decoration (1 each semester)

HARRIET GARRELS

Sec. I. (Second Half) W 6-7. Given at Department of Agriculture. \$6
 Sec. II. (First Half) W 8:30-9:30. Given at Meridian Hill, 16th and Euclid
 Sts. N.W. \$6

The *first half* includes color, principles of arrangement, walls, floor coverings, window treatments and lighting. The *second half* includes the study of furniture (modern and antique), the most popular English and American styles, including modern accessories; pictures; and flower arrangement.

194. Introduction to Art (2 each semester)

Th 6:15-8:15. \$12

PAUL L. GRIGAUT

The first semester will consist of a broad historical survey of man's creative effort in architecture, sculpture, and painting from the origin to the present. In the second semester special emphasis will be placed on French and American art, particularly painting, of the 19th and 20th Centuries. Illustrated lectures, assigned readings, and reports. The course will be supplemented with visits to museums in or near Washington.

Graphic Methods for Presenting Statistical and Geographic Data

(See Mathematics and Statistics 124)

MECHANICAL ARTS

188. Glass Blowing (2 each semester)

M-W 6-7:30. \$20 (including materials)

L. B. CLARK

A laboratory course for technicians. Simple manipulation of joining, bending, and shaping is carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types are made. During the first semester the soft glasses are utilized for practice; during the second semester the related glasses are used. Ample opportunity for advanced work is given those who show themselves particularly adapted to the work.

TEXTILES

189. Introduction to Textile Technology (3)

M-W 8-9:30. \$18. Repeated in Spring.

STANLEY A. SOKOLOFF

A practical course in the fundamentals of textiles, from fiber to fabric. Intended to be particularly useful to procurement officers, engineers, and others with occupational interest in the subject, as well as informative to those seeking only a systematic understanding of our textile surroundings. Topics covered are: characteristics and identification of fibers; yarns and spinning; weave design and the loom; dyestuffs and their application; finishing processes; construction and nomenclature of typical fabrics; testing; government specifications and trade standards. Emphasis is placed on cotton, wool, and rayon, although other fibers (including the latest synthetics) are covered. Students will work with samples of various materials discussed.

190. Textile Design and Fabric Development (3) Spring

STANLEY A. SOKOLOFF

[191.] Cotton Classing

R. L. KAUSE

[] Not given 1944-45.

UTILITY ADMINISTRATION AND REGULATION

Note: These courses are offered to meet the special needs of a large group of Federal employees. For their convenience the classes will be held in buildings of the Federal Power Commission, 18th and Pennsylvania Ave., N.W.

Information about the technical content of the courses may be obtained from Dr. Fayette S. Warner. Call Branch 222, Federal Power Commission.

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677. Public Power (2)

Tu 7:30-9:30. \$14

H. W. BLALOCK assisted by
JUDSON KING and other SPECIALISTS

General review of the development and operations of the publicly owned electric utilities in America. Both historical and statistical analyses of the numerous problems of the publicly owned utilities, involving organization, financing, operations, rates, sales, costs, legal or political obstacles, and "yardsticks." The development and operations of the following publicly owned electric utilities: municipal, district, cooperative, State and Federal.

679. Electric and Gas Utility Rates (2)

Th 7:30-9:30. \$14

H. ZINDER and W. E. CAINE

Principles and practice of rate design; customer and service classifications; engineering and economic factors in rates and rate contract forms and provisions; discussion of allocation of costs; problems in determination of rate discrimination; review of problems of rate base, operating expenses, depreciation and rate of return.

857. Electric Utility Engineering (2 each semester)

Tu 7:30-9:30. \$14

J. J. A. JESSEL assisted by W. J. LYNOTT, JR.

The fundamentals of electric utility engineering and their practical application to generating, transmitting, and distributing electric energy by electric utilities. Designed for engineers, engineering aids, lawyers, accountants and others who desire a broader understanding of the basic principles of electric utility engineering as applied to operating electric utilities. Subjects covered are: A general description of production, transmission, and distribution plants of electric utility, including each of the units of the property and an explanation of its functions; lectures and case studies in design and operation of electric generating stations, transmission lines and substations, and distribution substations, feeders, transformers, and services; discussions of practices followed by electric utilities in serving different classes of customers.

[366.] Original Cost Accounting for Electric and Gas Utilities (3 each semester)

K. L. SMITH and R. C. RAINWATER

[678.] Water Power Engineering (3 each semester)

KENNETH W. ROSS

[680.] Public Utility Evidence (3 each semester)

LAMBERT McALLISTER and WILLARD GATCHELL

[581.] Manufacturing Industries and Their Use of Energy (2)

FAYETTE WARNER and S. H. THOMPSON

[] Not given 1944-45.

Department of Languages and Literature

DEPARTMENTAL COMMITTEE

HARRY B. HUMPHREY, Ph.D., Principal Pathologist (retired), Bureau of Plant Industry, Soils, and Agricultural Engineering (Chairman)
GOVE HAMBIDGE, A.B., Coordinator of Research Publication, Agricultural Research Administration
M. C. MERRILL, Ph.D., Chief of Publications, Office of Information
MADALINE W. NICHOLS, Ph.D., Associate Professor in History and Spanish, Goucher College
RALPH R. SHAW, M.S., Department Librarian (on military leave)

IMPORTANCE OF ENGLISH WRITING AND SPEECH

Among students preparing for technical careers and among busy people employed on the basis of their technical competence, there is an inevitable tendency to concentrate on subject-matter specialties, to the great neglect—if not exclusion—of the auxiliary subjects that can effectively implement such specialties. It is common knowledge in the Government service that nothing so much retards the progress of many young technicians, scientists, and other professional personnel as their inability to incorporate the results of their thinking and of their research in effective, concise, lucid English, written or oral. Technical knowledge is of no value unless it can be communicated to others. There are indeed few persons who cannot greatly benefit from the further sharpening of their tools of communication.

In selecting for the Department of Languages and Literature the courses in English here described, much thought and care have been given those branches of our language that are basic and necessary to its intelligent use and finesse in expression. The major objective is the development of facility of expression, both oral and written, so that thoughts and feelings can be presented clearly, interestingly, and convincingly.

—o—

Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figures in parenthesis following the course title indicate number of semester credits.

—o—

ENGLISH

222. Composition and Rhetoric (3 each semester)

Tu 6-9. \$18

SUSAN E. HARMAN

Equivalent of freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to

more advanced English studies. Special attention given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, diction, etc. Exercises in writing short and long themes and in studying, analyzing, and evaluating selected English prose texts. (Students who have completed four credits under the former arrangement of the course may obtain the additional credit requirement in the spring semester.)

223. Descriptive English Grammar (2)

M 6-8. \$12. Repeated in Spring

SUSAN E. HARMAN

A course in grammatical principles, stressing sentence structure and correct English form. Exercises in diagramming and analyzing sentences and in correcting examples of English.

WRITING AND EDITING

224. Creative Writing (2)

Th 6-8. \$12. Repeated in Spring

DEWITT C. WING

Primarily this course aims to develop the student's inclination to practice writing through guidance and example. Emphasis is laid on facility of expression. The course presupposes fundamental knowledge of composition. Stories, sketches, articles, book and magazine reviews, personal letters, and letters to editors are assigned work.

225. Editing (3)

M-W 6-7:30. \$18

M. C. MERRILL and SPECIALISTS

Limited to 40 students.

Intended primarily for those seeking information on editorial techniques involved in handling manuscripts after they leave the author's hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proofreading. Practical examples of editorial work are discussed in class. Opportunity for some familiarity with the style manual of the Government Printing Office is provided. Collateral reading is indicated. Those desiring credit for the course are required to pass a written examination at the end of the semester.

237. Government Printing Procedure (1)

F 7-8. \$6

LOUIS H. FRANKEWICH

Intended for those whose task it is to make arrangements for the printing of books, pamphlets, posters, folders, charts, forms, and other printed matter, and who deal with author or editor and the printer. Subjects covered include: analysis of the manuscript and its purpose to determine the format of the printed piece; copy fitting and measuring; organization of copy; economy of attention of the reader; legibility and readability; type faces and typography; illustrations; printing processes; paper; binding; preparation of copy for the printer, handling of proofs; specifications and cost factors. The knowledge of methods and procedures to be acquired from this course is intended to give the students competence and confidence in dealing with author, editor, and printer.

226. Writing for Official Purposes (2)

F 6-8. \$12. Repeated in Spring

HOWARD ZANHISER

How to present facts and ideas in official writing is the problem of this course. Every type of writing has its own requirements. Official writing,

though like other writing in most respects, has important peculiarities. For example, it must respect the boundaries of science, of governmental organization, and of official policy. Frequently the attempt to do so makes it wordy, wooden, and lifeless. The course, which presupposes some writing experience, considers ways of making government writings clear, vigorous, and readable in spite of the necessary rules and restrictions. It shows where the limitations do not apply, as well as where they do, so that all possible freedom may be developed. One major writing project is required to earn credit for the course.

568. Readable Writing and Simplification (2)

F 6-8. \$14. Repeated in Spring

RUDOLF FLESCH

The course will consist of workshop and lectures in about equal parts. In the workshop students will analyze and rewrite samples of unreadable English. Lectures will deal with the reading habits and abilities of American adults; how we read and understand; how English and other languages express ideas; modern trends in English; easy and difficult language elements; how to test readability; how to simplify; how to use tables, graphs, and illustrations; characteristics of official, legal, technical, magazine, and newspaper styles; the role of simple language in Government.

[565.] Writing of Documented Papers (2)

HARRY B. HUMPHREY

[227.] Workshop in Government Radio Programs (3 each semester)

SPEECH

228. Fundamentals of Speech (2)

Tu 6-8. \$12

HESTER B. PROVENSEN

A course to develop in the speaker the ability to communicate his ideas readily and effectively through the study of audience analysis, distinct utterance, outlining, word usage, enrichment of vocabulary, and voice production. Ample opportunity to speak. Individual criticism.

229. Effective Speaking (2) Spring

HESTER B. PROVENSEN

232. Voice and Remedial Speech (2)

Tu 6-8. \$15. Repeated in Spring

RICHARD R. HUTCHESON

Study and intensive drills in voice production, flexibility, range, articulation, and enunciation. Training and practice are designed to improve vocal conditions for all speech purposes and to remedy minor speech difficulties. In order that students may receive more individual attention, registration is limited to twenty.

43. Personal Development (non-credit)

W 6-8. \$12. Repeated in Spring

HESTER B. PROVENSEN

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, and cultivation of wider range of interest and curiosity. Actual social situations created and discussed. Conferences, guest speakers.

[] Not given 1944-45.

566. Advanced Diction for Executives (2)

F 6-8. \$14

ROBERT T. OLIVER

A practical study of word choice and discrimination, based upon the new research in vocabulary and its relation to effective thinking, speaking, and writing. Keyed to executives who wish to increase their verbal ability; enrollment is limited to those whose Civil Service rating is CAF-7, P-2, or higher.

231. Speech for Business and Government (2)

M 6-8. \$12

GEORGE E. BEAUCHAMP

Instead of emphasizing public speaking, this course deals with how to present clearly one's ideas, adjust complaints, make oral reports, and conduct or take part more effectively in the personal interviews, conferences, and discussions which are a part of government and business procedure. Training in organizing and expressing one's thoughts with more effect in day-to-day situations forms the basis of the course.

567. Principles of Persuasion (2) Spring

ROBERT T. OLIVER

IMPORTANCE OF FOREIGN LANGUAGES

In his *Education* Henry Adams says of his experience:

"Had Adams in 1894 been starting in life as he did in 1854, he must have repeated that all he asked of education was the facile use of the four old tools: Mathematics, French, German, and Spanish. With these he could still make his way to any object within his vision, and would have a decisive advantage over nine rivals in ten. Statesman or lawyer, chemist or electrician, priest or professor, native or foreign, he would fear none."

If he were writing today Adams might be willing to add other languages to the list or to permit their substitution for those mentioned. In any case, what he says forcefully indicates the tremendous importance of foreign-language study.

By its spectacular military events and its unprecedented expansion of all kinds of international activities, the war has greatly increased interest in nearly all foreign languages. Research workers, propaganda analysts, persons engaged in all aspects of international relations, and persons scheduled for overseas assignments are in vital need of foreign-language instruction—instruction in many languages little taught before the war, in facility of speech and ease of writing, and in beginning courses, advanced courses, and review courses. All these opportunities are made available through the Graduate School.

It is the aim of those responsible for these courses to conduct them so as to develop in their students a ready and intelligent use of the language. The person who is seeking the maximum practical value from a foreign language must learn not only to translate it but to think in it well enough for translation to be unnecessary.

He should acquire a spoken command of at least one language other than his own. No one should be content with a smattering of a language. He should attempt to perfect his skill in it until the language becomes a useful auxiliary means of communication.

—O—

Unless otherwise specified, all foreign language courses are organized as follows:

Elementary year—foundation work in grammar, vocabulary, reading, and translation, with some conversation.

Intermediate year—grammar review, more difficult reading and translation, use of idioms, writing and discussion in the language.

Conversation—development of facility in discussion and reading, use of idioms, writing and thinking in the language without translating.

Note: Course numbers followed by (a) are first-half of that course, or by (b) are second-half.

ARABIC

233^a. Elementary Arabic (2)

F 6-8. \$12

AFIF TANNOUS

233^b. Elementary Arabic (2)

W 6-8. \$12

SHUKRY E. KHOURY

234^a. Intermediate Arabic (2)

M 6-8. \$12

HABIB KURANI

235^a. Conversational Arabic (2)

F 8-10. \$12

SHUKRY E. KHOURY

CHINESE

238^a. Elementary Chinese (4)

Tu-Th 6-8. \$24

I-MIEN TSIANG

An introductory course in the fundamentals of the Chinese language (Mandarin): elements of grammar, reading and writing of Chinese characters, and simple conversation.

240^a. Newspaper Chinese (4)

M-F 6-8. \$24

I-MIEN TSIANG

This course is an introduction to newspaper reading. The text studied consists of selected news items and articles of current interest. Newspaper style will be analyzed, with emphasis on sentence construction, typical phrases, and idiomatic expressions.

Prerequisite: Intermediate Chinese, or its equivalent.

238^b. Elementary Chinese (4)

Tu-Th 8-10. \$24

TO BE ANNOUNCED

[239.] Intermediate Chinese (4)

[] Not given 1944-45.

DUTCH

243^a. Elementary Dutch (2)

W 6-8. \$12

HENRI A. KUYPER

[244.] Intermediate Dutch (2)

HENRI A. KUYPER

CZECH

248^a. Elementary Czech (3)

Tu-Th 6-7:30. \$18

MILADA F. MARSALKA

249^a. Intermediate Czech (3)

W 6-7:30 Th 7:30-9. \$18

MILADA F. MARSALKA

FRENCH

253^a. Elementary French (3)

M-Th 6-7:30. \$18

HARRY B. HUMPHREY

253^b. Elementary French (3)

M-Th 8-9:30. \$18

HARRY B. HUMPHREY

254^a. Intermediate French (3)

Tu-F 6-7:30. \$18

HARRY B. HUMPHREY

255^a. Conversational French (3)

Tu 6-9. \$18

PAUL L. GRIGAUT

GERMAN

259^a. Elementary German (3)

M 6-9. \$18

C. H. LIENEWEBER

259^b. Elementary German (3)

F 6-9. \$18

MAX LEDERER

260^a. Intermediate German (3)

W 6-9. \$18

C. H. LEINEWEBER

261^a. Conversational German (3)

M 6-9. \$18

MAGNA E. BAUER

263^a. German Translation (3)

W 6-9. \$18

IRA T. BRAUNSTEIN

Last hour devoted to conversation.
Prerequisite: Two years of German.

[] Not given 1944-45.

HINDUSTANI

- 268^a. Elementary Hindustani (Sanskrit script) (3)**
 M 6-9. \$18 R. V. GOGATE
- 269^a. Intermediate Hindustani (Sanskrit script) (3)**
 Th 6-9. \$18 R. V. GOGATE

ITALIAN

- 270^a. Elementary Italian (3)**
 Tu-Th 6-7:30. \$18 MARIO MAIOLATESI
- 270^b. Elementary Italian (3)**
 W 6-9. \$18 JOHN ROSETTI
- 271^a. Intermediate Italian (3)**
 W 6-9. \$18 MARIO MAIOLATESI
- 272^a. Conversational Italian (3)**
 Tu-Th 8-9:30. \$18 MARIO MAIOLATESI

JAPANESE

- 275^a. Elementary Japanese (3)**
 Tu-Th 6-7:30. \$18 JOSEPH G. YOSHIOKA
- 276^a. Intermediate Japanese (3)**
 Tu-Th 8-9:30. \$18 JOSEPH G. YOSHIOKA

MALAY

- 280^a. Elementary Malay (3)**
 M-F 8-9:30. \$18 I-MIEN TSIANG

POLISH

- 284^a. Elementary Polish (3)**
 M 6-9. \$18 IRA T. BRAUNSTEIN
- [285.] Intermediate Polish (3 each semester)**
 IRA T. BRAUNSTEIN

PORTUGUESE

- 290^a. Elementary Portuguese (3)**
 Tu-Th 6-7:30. \$18 RAUL D'ECA
- 291^a. Intermediate Portuguese (3)**
 Tu-Th 7:30-9. \$18 RAUL D'ECA

[] Not given 1944-45.

RUSSIAN

295^a. Elementary Russian (3) \$18

Sec. I. Tu 6-9.
 Sec. II. W 6-9.
 Sec. III. M 6-9.

GEORGE M. SAHAROV
 NATHALIE VON BRETZEL
 ERIC T. SCHULER

295^b. Elementary Russian (3)

F 6-9. \$18

NATHALIE VON BRETZEL

296^a. Intermediate Russian (3)

W 6-9. \$18

GEORGE M. SAHAROV

299^a. Advanced Russian (third year) (3)

M 6-9. \$18

GEORGE M. SAHAROV

Reading of selected pieces from Russian literature; writing of compositions; conversation on topics of material read and compositions prepared.

[297.] Conversational Russian

SPANISH

300^a. Elementary Spanish (2) \$12

Sec. I. M 6-8
 Sec. II. M 6-8
 Sec. III. M 8-10
 Sec. IV. Tu 6-8
 Sec. V. Tu 8-10
 Sec. VI. W 6-8
 Sec. VII. W 6-8
 Sec. VIII. Th 6-8
 Sec. IX. F 6-8
 Sec. X. F 6-8

RUBERTA M. OLDS
 MARJORIE C. JOHNSTON
 MANUEL DE J. SAINZ
 RUBERTA M. OLDS
 OLIVIA RUSSELL
 MARJORIE C. JOHNSTON
 DOLORES GUEST
 MANUEL I. ABELLA
 MARGARET WOODS
 CONSUELO BATISTA

300^b. Elementary Spanish (2) \$12

Sec. I. M 6-8
 Sec. II. Tu 6-8
 Sec. III. Tu 8-10
 Sec. IV. W 6-8
 Sec. V. F 6-8

MANUEL DE J. SAINZ
 MANUEL I. ABELLA
 RUBERTA M. OLDS
 ESTHER R. BROWN
 DOLORES GUEST

301^a. Intermediate Spanish (2)

F 6-8. \$12

ESTHER R. BROWN

302^a. Spanish Conversation and Literature (2) \$12

Sec. I. M 6-8.
 Sec. II. Th 6-8.

ENRIQUE A. GIRO

304^a. Commercial Spanish (3)

F 6-9. \$18

MICHAEL LEVER

Advanced composition in commercial correspondence; commercial geography, monetary systems, certificates and invoices, etc.; cable systems, insurance and banking abbreviations. Designed to give the intermediate student of Span-

[] Not given 1944-45.

ish familiarity with current commercial correspondence usage and ability to compose acceptable commercial correspondence.

Prerequisite: One year of elementary Spanish or equivalent.

La America Latina y Los Estados Unidos (See Social Sciences 611)

LITERATURE

44. Seminar in the Classics (non-credit)

Tu 8-10. \$15

IOLA R. SCOFIELD

Seminar discussion of great books of poetry, history, philosophy, and criticism. The reading list for the fall term emphasizes social and political ideas and will include: Plato, *The Republic*; Aeschylus, *Oresteia*; Aristotle, *Politics* (selections); Dante, *The Divine Comedy*; Machiavelli, *The Prince*; Voltaire, *Candide*; Rousseau, *A Discourse on Political Economy* and *The Origin of Inequality*; Adam Smith, *The Wealth of Nations*; and Hamilton and Madison, *The Federalist Papers* (selections).

48. Tutorial in the Classics (non-credit)

Tu 6-7. \$7.50

IOLA R. SCOFIELD

Close reading and detailed analysis of Plato's *The Republic*.

795. Extension Thesis (6 when approved)

Registration fee \$3

M. C. WILSON

An opportunity will be afforded to qualified persons who desire to undertake a study of an agricultural extension problem and to submit a thesis. The amount of credit, to be determined by a thesis committee, will be based upon the nature of the problem, amount of work, and quality of the thesis.

Note: Other courses usually offered in Extension Education are deferred until further notice.

Department of Mathematics and Statistics

DEPARTMENTAL COMMITTEE

- W. EDWARDS DEMING, Ph.D., Adviser in Sampling, Bureau of the Budget (Chairman)
A. E. BRANDT, Ph.D., Chief of Erosion Control Practices, Soil Conservation Service (on leave)
M. A. GIRSHICK, M.A., Senior Agricultural Statistician, Bureau of Agricultural Economics
B. R. STAUBER, M.A., Relocation Planning Officer, War Relocation Authority
O. C. STINE, Ph.D., Head, Division of Statistical and Historical Research, Bureau of Agricultural Economics

OPPORTUNITIES FOR STUDY

To a greater extent than ever before, our country is dependent on the analysis of quantitative data. Action in the solution of problems in industrial and agricultural production requires prediction, which in turn requires skill in the collection, evaluation, and analysis of data, plus knowledge of the subject matter gained through studies of economics, sociology, engineering, or other branches of the natural and social sciences. In industry and in Government service, the demand for valid methods of prediction as a basis for action is placing more and more stringent requirements on statistical methods, as more and more is expected of public programs designed to stabilize or improve economic and social conditions.

The situation in Washington creates an unusual opportunity for students who wish to pursue studies in statistics. For years, Washington has more and more been becoming the center of many activities, political, economic, and scientific. Government statisticians, by the nature of their duties, must make predictions, recommend action, and face the consequences. They are daily faced with exacting realities and responsibilities; they are daily putting their statistical methods to test, and through research are developing new statistical methods to meet new and more exacting requirements. Some of the leading statisticians of Washington are giving courses in the Graduate School.

Employment opportunities are greater now than ever before for people trained in the statistical aspects of various fields of subject matter. The demand ranges from the statistical clerk who may need training in only one or two basic courses, on up to the highest-grade professional statistician who must be thoroughly trained not only in some field of subject matter, but also in higher mathematics and advanced statistical courses. Courses offered in the Graduate School program are designed to afford training at all levels, from

the most elementary to the most advanced, with applied courses in several fields of subject matter.

CERTIFIED STATEMENTS OF ACCOMPLISHMENT

A Certified Statement of Accomplishment is offered in each of four fields of statistical study—fields representing areas of statistical preparation and application most useful in the public service. The required program in each field is outlined below. The student who completes the basic courses and earns 24 credits in specialized courses listed in any column, with substitutions only as specifically approved, is eligible to receive a Certified Statement of Accomplishment bearing the official seal of the School and signed by the Director and the Chairman of the Department of Mathematics and Statistics. The Statement is not a diploma nor simply a transcript of credit, but it combines certain useful features of both. It is a certification that the student has completed a program of study which, in conjunction with collateral training in a subject-matter field of application, prepares him for effective public service in a particular statistical field. Courses completed and the quality of accomplishment will be recorded on the back of the Statement, which may be used as a personal record of achievement or a public record of qualification.

SUGGESTIONS FOR PROGRAMS OF STUDY

A statistician is one who possesses special skills for measuring the effect of causes of variability and for discovering their causes. His skills assist him to distinguish between (i) variations the causes of which can be discovered, and (ii) variations the causes of which cannot be discovered. He thus possesses special skills for subjecting theories to test, for verifying and refining scientific laws, and for making predictions. His work calls for special training in the collection, presentation, and analysis of numerical data. He is particularly equipped by training and experience to assist in the formulation of scientific courses of action in government, manufacturing, and distribution. The courses offered on the following pages provide training in general principles, and illustrations of specific application.

A fundamental requirement of a good statistician is that he know the subject matter of the field that he is working in. Completion of a particular curriculum of study in statistics will not of itself produce a statistician. The student of statistics, aspiring to obtain a Certified Statement of Accomplishment, is expected to attain competence also in some subject-field such as economics, soci-

COURSES LEADING TO CERTIFIED STATEMENTS OF ACCOMPLISHMENT IN STATISTICS

With Concentration in One of the Following Fields of Application

28

PROCESSING OF DATA

- 102. Algebra
- 124. Graphic Presentation of Data
- 127. Introduction to Statistical Analysis

SOCIAL SCIENCES

BASIC COURSES—Required of all candidates

- 102. Algebra
- 103. Trigonometry and Analytic Geometry
- 127. Introduction to Statistical Analysis

BIOLOGICAL AND PHYSICAL SCIENCES

- 102. Algebra
- 103. Trigonometry and Analytic Geometry
- 126. Introduction to Experimental Design
- or
- 127. Introduction to Statistical Analysis

DESIGN AND INTERPRETATION OF SAMPLING SURVEYS

- 102. Algebra
- 103. Trigonometry and Analytic Geometry
- 106. Calculus
- 127. Introduction to Statistical Analysis

SPECIALIZED COURSES—24 credits, selected from appropriate field of application, required of all candidates

- 518. Machine Tabulation
- 519. Advanced Study of Tabulating Equipment
- or
- 517. Tabulation Procedures
- 520. Statistics of the Federal Government
- 722. Processing of Sample and Complete Surveys
- 726. Interpretation of Statistical Calculations
- 727. Planning of Statistical Surveys
- 729. Population Statistics

- 106. Calculus
- 702. Theory and Practice of Sampling
- 703. Interpolation and Finite Differences
- 723. Design and Analysis of Complex Experiments
- 726. Interpretation of Statistical Calculations
- 731. Least Squares and Curve Fitting
- 734. Statistical Methods for Research Workers

- 702. Theory and Practice of Sampling
- 708. Linear Algebra
- 712. Theory of Functions
- or
- 500. Advanced Calculus
- 723. Design and Analysis of Complex Experiments
- 735. Theory of Sample Surveys
- 739. Multivariate Analysis
- 740. Analysis of Variance
- 741. Theory and Application of the Characteristic Function
- 742. Modern Theories of Statistics

- 733. Theory of Sampling

ELECTIVE COURSES

- 500. Advanced Calculus
- 502. Differential Equations
- 701. Vectorial Geometry
- 704. Interpolation, Approximation, and Mechanical Quadrature

- 712. Theory of Functions
- 709. Theory of Infinite Processes
- 741. Theory and Application of the Characteristic Function

ology, biology, agriculture, or engineering. The School will issue a Certified Statement of Accomplishment in statistics only after the Departmental Committee is satisfied that the student has attained such competence in addition to the completion of an approved curriculum of study in statistics.

People who do not intend to become professional statisticians but simply desire to learn the elements of statistics as a tool, or people who desire to train for clerical-statistical positions, should, of course, ignore the requirements for a Certified Statement and concentrate on basic statistical courses suited to their special needs.

The requirements set for statisticians by the United States Civil Service Commission vary with the level of position and the field of work involved. It should be noted that academic training in statistics is not of itself qualifying; where academic background in statistics is necessary there are other additional requirements such as general education, professional specialization, and experience.

It is suggested that those interested in taking courses related directly to their present assignment, and those uncertain as to which courses parallel the level of their training and backgrounds, consult with their supervisors. Attention is called again, in this connection, to the counseling services described on page 5.

SEMINARS IN SAMPLING

Seminars in sampling and statistical inference are held approximately six times a year under the direction of Dr. W. Edwards Deming. These meetings are held primarily for advanced students in the Graduate School, but are addressed and attended by the leading mathematical statisticians in the city. No fee is charged; registration, however, is required. Applications for new admissions to the seminar should be sent in writing to the Director, with a statement regarding the applicant's qualifications for attendance. Notices regarding meetings are sent to those whose names are on the list. The following four meetings were held during the past academic year:

Nov. 2: Lillian H. Madow and William G. Madow, "On a theory of systematic sampling." Chairman, W. Edwards Deming.

Dec. 13: Louis Guttman, "A new theory and method for scaling qualitative data." Chairman, M. A. Girshick.

Jan. 17: Morris H. Hansen and William N. Hurwitz, "On the optimum proportion of interview follow-up on a mailed questionnaire." Chairman, Frederick F. Stephan.

Apr. 11: G. Rupert Gause and Lawrence W. Shaw, "On the estimation of the error arising from random assignable causes." Chairman, Lt. John H. Curtiss.

Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Asterisk (*) before numbers, may be applied toward resident credit for advanced degree at American University. Figures in parenthesis following the course title indicate number of semester credits.

MATHEMATICS

1. Review of Mathematics (non-credit)

Tu 6-9. \$18

EMIL SCHELL

Review course on first-year college level. Algebra, trigonometry and analytic geometry, with emphasis on graphical methods of analysis, and with a brief introduction to calculus methods.

Prerequisite: Some college mathematics.

102. Algebra (2)

M 6-8. \$12

C. H. GRAVES

Fundamental rules of algebra; exponents; logarithms; proportion; manipulations with proportions; identities and conditions; solution of equations; binomial theorem; numerical approximations. Uses of symbols of operations. Determinants; solution of equations by the reciprocal matrix. Theory of equations; progression series. Permutations and combinations. Graphical methods are illustrated throughout the course. Emphasis is placed on applications to statistics and the physical sciences.

Prerequisites: High-school algebra, and plane and solid geometry.

103. Trigonometry and Analytic Geometry (2) Spring

C. H. GRAVES

106. Calculus (3 each semester)

W-F 6-7:30. \$18

E. J. FINAN

First semester. Variables, functions, limits, continuity, divided differences, derivatives. Application of the derivative to geometry, physics, curve fitting, and analysis. Mean value theorem. The anti-derivative. Riemann integration.

Prerequisite: Algebra and trigonometry and analytic geometry.

Second semester. Standard integral forms. Partial and total derivatives. Constrained maxima and minima in two variables; Lagrange multipliers. Interpolation. Taylor's series with one, two, and three variables. Propagation of errors. Series. Multiple integrals. Line integrals. Approximate integration; the Euler-Maclaurin formula for integration and summation. History and application stressed.

Prerequisites: College algebra, trigonometry, analytic geometry, and the first semester of calculus.

[500.] Advanced Calculus (1945–46)

C. WINSTON

*502. Differential Equations (3 each semester)

W 6:30-9:30. \$21

LOUIS J. PARADISO

Calculus will be reviewed as necessary. The course will cover ordinary and partial differential equations with application to physics, economics, and sta-

[] Not given 1944–45.

tistics. Solution in series, leading to Bessel functions and other series. Graphical and numerical solutions to ordinary differential equations.

Prerequisite: Calculus.

***504. Methods of Applied Mathematics (2 each semester)**

F 6-8. \$14

NORMAN DAVIDS

This course will cover the mathematical tools and underlying theory needed for applications to problems in physics and other applied mathematics. Topics: initial and boundary value problems of the potential equation, wave equation, vibrations and characteristic-value problems; the method of solution by expansion into series of orthogonal functions, especially Fourier series, spherical harmonics, and Bessel functions; operational methods, Laplace and Fourier transforms; Green's potentials; integral equations; calculus of variations; numerical methods such as Rayleigh-Ritz and finite differences; applications to electricity and magnetism, radio, stress analysis, etc.

Prerequisite: Advanced calculus, or theory of functions, or differential equations.

***700. Vector Analysis (2)**

Tu 7:30-9:30. \$14

S. B. LITTAUER

Development of the fundamentals of the algebra and calculus of vectors, for the treatment of statistical and engineering problems. Scalar and vector fields. Stokes', Gauss', and Greene's theorems. The hydrodynamical equations of continuity, Maxwell's hypotheses for free space. Applications of vector methods to topics of particular interest to members of the class is made as time permits. Text: Wills, *Vector Analysis*.

Prerequisites: Calculus, plus either a year of college physics or a year of statistics.

701. Vectorial Geometry (2) Spring

S. B. LITTAUER

**707. Statistical Mechanics and Kinetic Theory of Gases
(2 each semester)**

Tu 8-10. \$14

RICHARD K. COOK

A study will be made of the principles and methods of statistical mechanics. The methods will be applied to phenomena explainable on the basis of a molecular structure. Greatest emphasis will be placed upon applications to gases (kinetic theory of gases). Physical bases for the laws of thermodynamics will be developed and the statistical concepts of temperature and entropy explained. The elements of quantum statistics will be discussed and applied to problems of general interest.

Prerequisite: Differential and integral calculus, college physics, and first courses in mechanics and thermodynamics.

708. Linear Algebra (3) Spring

MYER A. GIRSHICK

***712. Theory of Functions (2 each semester)**

W 8-10. \$14

C. WINSTON

Calculus will be reviewed as necessary. Complex numbers, mapping. Branches and singularities; poles and zeros. Theory of limits; sequences. Convergence; uniform convergence. Line, surface, and volume integrals. Expansion by residues. Taylor's and Laurent's series. Fourier series. Analytical continuation. Bernoulli numbers. Euler numbers. Gamma and Beta func-

tions. Riemann surfaces. Asymptotic expansions. Summability. The hypergeometric equation. Elliptic functions.

Prerequisite: Calculus.

[703.] **Interpolation and Finite Differences** (1945-46)

W. EDWARDS DEMING

[704.] **Interpolation, Approximation, and Mechanical Quadrature** (1948-49)

J. SHOHAT

[705.] **Thermodynamics** (1945-46)

FERDINAND G. BRICKWEDDE

[706.] **Analytic Mechanics** (1945-46)

RICHARD K. COOK

[709.] **Theory of Infinite Processes** (1947-48)

C. WINSTON

STATISTICS

Beginning Courses

123. Survey of Statistics (3 each semester)

Th 7-10. \$18

SAMUEL WEISS and JOSEPH STEINBERG

A non-mathematical course designed particularly to train statistical clerks in the statistical treatment of data in the fields of economics, sociology, and business. Algebra is reviewed as required. Operations with symbols. Summarizing data by tabulation and by statistical predictions. The Shewhart control charts. Randomness. Computations and interpretation of statistical functions. Correlation. Business indexes. Trend analysis and curve fitting. Graphic analysis. Lectures and supervised instruction in calculations and table making. Short cuts by the use of charts, multiplication tables, logarithms, slide rule and other devices.

124. Graphic Methods of Presenting Statistical and Geographic Data (2 each semester)

M 6-9. \$12

R. G. HAINSWORTH

First semester. Application of various classes, forms, and types of illustrations. Actual working examples in time series charts, frequency diagrams, graphic correlation charts, pictorial symbol charts, and other illustrative examples. Reduction, reproduction and color application in relation to preparation of graphic charts, graphs and diagrammatic illustrations.

Second semester. Interpretation and classification of maps both statistical and geographic. Standards and tolerances as applied to maps; discussion of various methods of preparing maps both statistical and geographic. Actual working layouts of grid systems for the more important projections will be made in class; working examples will also be made of the various types of statistical maps. Color, reproduction, standardization, methods of compiling data, and other important factors relating to general mapping will be discussed.

Prerequisite: An introduction course in statistics or experience approved by the instructor.

[] Not given 1944-45.

126. Introduction to Experimental Design (2 or 3)

M 4:45-6:45 beginning Nov. 13 (at Plant Industry Field Station at Beltsville).
 \$12 for 2 cr. \$18 for 3 cr. O. A. POPE

For students of the plant and animal sciences who wish an introduction to experimental designs and analyses. It is non-mathematical and is designed particularly as a forerunner to Design and Analysis of Complex Experiments (723). Topics are randomized blocks, Latin squares, factorial designs, and pseudo-factorial designs. Applications to agricultural science, engineering, and industrial tests. An additional seminar is held once a week, time to be arranged, for consideration of special research problems; this seminar is optional, giving one additional credit to those who complete the assignments. There are no mathematical prerequisites, but the student must possess knowledge of some particular field in the natural or social sciences.

127^a. Introduction to Statistical Analysis (2)

Th 6-8. \$12. Repeated in Spring C. M. PURVES and BENJAMIN J. TEPPIG

The collection of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series; preparation of formulas for machine calculations. Use of slide rule and charts for performing calculations.

Prerequisite: Algebra.

127^b. Introduction to Statistical Analysis (2)

W 6-8. \$12. Repeated in Spring C. M. PURVES and BENJAMIN J. TEPPIG

A continuation of Introduction to Statistical Analysis 127^a. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to statistical inference. Adaptation of formulas to machine correlation.

Intermediate Courses

516. Intermediate Statistics (2 each semester)

Th 6-8. \$14

FRANCIS P. HOEBER

After a review of elementary principles and methods, a critical study is made of various topics, the purpose being to lay a foundation for effective work in statistical practice and for advanced study. Special attention is given to sampling and the uses of sample data.

Prerequisite: Statistics 127.

[517.] Tabulation Procedures

JAMES L. MCPHERSON

518. Machine Tabulation (1 each semester)

W 5-7. \$9

MILTON KAUFMAN

Registration limited to 30. Given in Rm. 2115 at the Census Building, Suitland. Registration may be made either at the Census or Graduate School.

The punch card method. Functions of the principal machines. Instruction covers actual wiring of all types of I.B.M. tabulating equipment. Use of cards to obtain sums of squares and cross products in correlation and curve fitting is demonstrated.

[] Not given 1944-45.

519. Advanced Study of Tabulating Equipment (1 each semester)

F 5-7. \$9

MILTON KAUFMAN

Given in Rm. 2115 at the Census Building, Suitland. Registration may be made either at the Census or Graduate School.

The solution of difficult problems in the application of tabulating equipment. The instruction includes the actual operation and wiring of the principal machines involved.

Prerequisite: A course in machine tabulation.

520. The Statistics of the Federal Government (2 each semester)

Tu 6.30-8:30. \$14

MORRIS B. ULLMAN

Designed to give acquaintance with the wealth of data available from Federal agencies. Attention will be paid to the methods used by different agencies for the collection of data; comparisons of biases, definitions, and basic concepts; different methods of presentation.

Prerequisite: Statistical experience in the Government service.

*Advanced Courses***702. Theory and Practice of Sampling (3 each semester)**

Th 7-10. \$21

W. EDWARDS DEMING

Applications to problems in population sampling, inventories, sociology, biology, agriculture, and industrial control of quality. The Shewhart criterion of randomness. Control charts. Statistical methods for reducing inspection, reducing rejections, and setting tolerances. Single, double, and multiple sampling for acceptance purposes. The point binomial, Poisson exponential, the Type III and normal limits. Student's distribution. Use of the Gamma and Beta functions. Fisher's distributions; analysis of variance. Various tests. Errors of the first and second kinds (Shewhart, Neyman-Pearson). Bayes and inverse probability. Confidence intervals and fiducial probability. Conditions necessary for validity. Interpretation of results; history.

Prerequisites: Calculus, an intermediate course in statistics, and experience.

726. Interpretation of Statistical Calculations (2 each semester)

M 6-8. \$14

ALEXANDER STURGES

First semester. The philosophy and assumptions involved in statistical inference from sampling data. The conditions of sampling will be stated and compared with practical situations. The effect of failure to meet the ideal conditions will be studied. Methods will be offered for deciding whether the sampling conditions depart too far from the ideal.

Second semester. The selection and use of statistical tests. The illustrative problems will deal with single and multiple attributes. Time series will be discussed in the light of some new methods.

Prerequisite: Introduction to Statistical Analysis, 1st and 2nd half; college algebra, and analytic geometry.

732. Sampling in Social and Economic Surveys (3)

Th 6:15-9:15. \$21

J. STEVENS STOCK and LESTER FRANKEL

Applications of the representative method to practical and timely problems. Fallacies of the total count. Accuracy and precision. Problems involved in the selection of a sample. The theory of random sampling. The choice of sam-

pling unit. Sub-sampling, stratified sampling, purposive selection. The use of intraclass correlation and analysis of variance in the design of sampling techniques. Analysis of cost data. Review of important sampling procedures as used in the United States and foreign countries.

Prerequisites: Introduction to Statistical Analysis, 1st and 2nd half; and experience in social surveys.

735. Theory of Sample Surveys (2 each semester)

W 8-10. \$14

WILLIAM G. MADOW and WILLIAM HURWITZ

History of sampling in social surveys. The use of statistical control in improving the quality and efficiency of the estimates. Calculation of sampling errors. Random, stratified random, purposive, double and systematic sampling. Cost function, choice of sampling unit; size and type of sample necessary to attain a stated degree of precision, and the distinction between precision and accuracy. The theory of probability is developed as necessary. The contributions of Fisher, Neyman, Yates, Cochran, and others are studied.

Prerequisites: Introduction to Statistical Analysis, 1st and 2nd half; calculus.

740. Analysis of Variance (3)

M 7-10. \$21

M. A. GIRSHICK

Selections from the works of Bartlett, Fisher, Neyman, Wilks, Yates, and others, with complete mathematical development of the formulas. Attention will be paid to the sampling conditions and the validity of the inferences drawn.

Prerequisites: Multivariate analysis; linear algebra.

745. Seminars in Sampling and Statistical Inference

W. EDWARDS DEMING

Notices regarding meetings are mailed to those who are registered. See the special announcement on page 29.

[723.] Design and Analysis of Complex Experiments

A. E. BRANDT

[731.] Least Squares and Curve Fitting

W. EDWARDS DEMING

[733.] Theory of Sampling

JEROME CORNFIELD and W. D. EVANS

[734.] Statistical Methods for Research Workers

WILLIAM G. MADOW and WILLIAM HURWITZ

[739.] Multivariate Analysis

M. A. GIRSHICK

[741.] Theory of Application of the Characteristic Function

SOLOMON KULLBACK

[742.] Modern Theories of Statistics

JOSEPH DALY

Labor Statistics¹ (3)

Th 8:20-10:30. \$30

JACOB PERLMAN

(¹ American University course. See A.U. catalog.)

[] Not given 1944-45.

Department of Office Techniques and Operations

DEPARTMENTAL COMMITTEE

JAMES F. GRADY, A.B., Executive Assistant, Recruitment and Manning Organization, War Shipping Administration (Chairman)
HENRY A. DONOVAN, Assistant Chief, Bureau of Agricultural and Industrial Chemistry
VIVIA A. FORD, B.S., Administrative Assistant to the Director, Office of Food Programs, Foreign Economic Administration
STROTHER B. HERRELL, Assistant Director of Personnel, Office of Personnel
JOHN S. LUCAS, Assistant Chief, Office of Plant and Operations

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Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figure in parenthesis following the course title indicates number of semester credits.

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CLERICAL-ADMINISTRATIVE PROCEDURES

The courses described under Clerical-Administrative Procedures are closely related to those offered in the Department of Public Administration and are an integral part of the program leading to the Certified Statement of Accomplishment in Administrative Procedures (see Department of Public Administration for details). They are practical, how-to-do-it courses chiefly of interest to persons in grade CAF-7 positions, or below, who are either working with these procedures, or who hope to train themselves for such positions, or positions requiring some familiarity with more than one of these procedural subjects (e.g., administrative assistants and head clerks).

408. Administrative Procedure (2)

Sec. I. Tu 6-8. \$12. Repeated in Spring
Sec. II. F 6-8. \$12. Repeated in Spring

THOMAS J. HICKEY
ROBERT R. EVANS

Intended for persons who wish to become Head Clerks or Administrative Assistants and who wish to organize their knowledge and experience in this field with that in view. Deals with practical aspects of the day-to-day operations of the chief clerk and administrative assistant. Emphasis is placed upon matters for which these persons ordinarily are responsible, such as preparation of budget data, procedural planning, personnel actions, orientation and assignment of new employees, and supervision. The relationship of these functions to specialized services offered by the central personnel, budget, and general service units are also discussed.

409. Administrative Procedure (2)

F 6-8. \$12. Repeated in Spring

PHILLIP T. THORSON

Subject matter same as in 408 except that the level of treatment of planning, procedure, and relationships, including case problems analyzed, is higher.

Prerequisite: Classification of CAF-5 or above.

410. Federal Auditing Procedure (2)

Tu 6-8. \$12. Repeated in Spring

CAREY G. CRUIKSHANK

This short, intensive course is designed particularly to train audit clerks drawn from among employees now working in the lower grades as clerks, typists, machine operators, etc., and to assist audit clerks in their present and prospective positions. It embraces explanations of, discussions on, and practice work with the most important types of Government vouchers and covers certain related procedures and documents. The manual used outlines in detail the various procedures.

The course covers general basic principles and definitions of terms; use of standard forms involved; General Accounting Office exceptions, and preparation of replies thereto; administrative suspensions and disallowances; application of statutes, regulations and the Comptroller General's decisions to auditing; special correspondence required in connection with such work; claims and adjustments; purchase order procedures; tax exemption; letters of authorization and travel authority; per diem allowances and computations; methods of travel; and the actual audit of Standard Form 1012 "Reimbursement" vouchers and Standard Form 1034 "Purchase" vouchers.

Note: Persons who want a short, sped-up approach limited to minimum requirements should take this course. Persons who want more thorough training and a more comprehensive coverage of auditing procedures should take the full-year course (described immediately below).

411. Auditing Procedure (2 each semester)

Sec. I. M 6-8. \$12

CAREY G. CRUIKSHANK

Sec. II. Tu 6-8. \$12

FRED J. KYTTLE

Similar to the course above but more thorough in treatment of the subject. Designed to assist audit clerks in present and prospective positions and to enable Government employees working in the lower grades as clerks, typists, etc., to fit themselves for more responsible and remunerative positions. It embraces explanations of, discussions on, and practice work with all types of Government vouchers and related documents. The manual used outlines in detail all the various procedures. During the first semester, the course covers general principles and definition of terms; use of Standard Forms involved; purchase vouchers; claims and adjustments; General Accounting Office exceptions; formal and informal contracts; relation of procurement to auditing; tax exemptions; transportation vouchers; suspensions and disallowances on all types of vouchers. During the second semester, the course covers letters of authorization and travel authority; per diem computations and allowances; methods of travel; reimbursement vouchers; pay rolls; advertising vouchers; adjustment vouchers; application of statutes, regulations and Comptroller General's decisions to auditing; collections and deposits; preparation of replies to General Accounting Office exceptions, and correspondence in connection with auditing.

412. Federal Accounting Procedure (2)

Tu 6-8. \$12. Repeated in Spring

CHARLES L. GRANT

Designed particularly to train accounting clerks through instruction of employees now working in lower grades and to assist accounting clerks in present and prospective positions. It embraces explanation of, discussion on, and practice work with the basic ledgers (allotment ledger, objective classification ledger, and general ledger) maintained in connection with funds made available to Federal agencies. Appropriation, apportionment, allotment, disbursement, collection, and reporting processes will be discussed and the relationship between administrative accounts and accounts kept by the Treasury Department and the General Accounting Office explained. (A more advanced course, Federal Government Accounting, is offered in the Department of Public Administration.)

413. Office Management (2)

F 6-8. \$12. Repeated in Spring

DANIEL M. BRAUM

Includes office layout, office housekeeping methods, formulation of office policy, organization of communications and records, work planning and operational analysis, utilization of available facilities, care and operation of office equipment, employee orientation and supervisory techniques, methods of securing employee participation, work evaluation and employee rating. The reference text is *Textbook of Office Management* by Leffingwell and Robinson.

414. Federal Personnel Procedure (2)

F 6-8. \$12. Repeated in Spring

VERNA C. MOHAGEN

Deals with basic practices and procedures designed to accomplish appointment, transfer, promotion, demotion, separation, and retirement of Federal employees. The course has three objectives: (1) to keep abreast of current developments in personnel procedures; (2) to become familiar with the legal and administrative background of such procedures (statutes, executive orders, decisions of the Comptroller General, the Civil Service Commission, and the War Manpower Commission, Administrative Orders, etc.); and (3) to visualize the constant need for streamlining procedures in the interests of simplicity and efficiency.

415. Federal Purchasing Procedure (1)

W 6-7. \$6

RAY WARD

Practical training in Government purchasing from various sources of supply such as Government contracts, Treasury Procurement Schedules, Prison Industries, and surplus lists; also theory and practice in contracting, preparation of bids, use of specifications, award of bids, source of supply contracts, and War Powers contracts. The relationship between the service of supply and related service functions such as accounting, fiscal, and budgetary will be stressed as tools in accomplishing legislative programs.

417. Records Management Procedure (2)

Tu 6-8. \$12. Repeated in Spring

L. E. DONALDSON, WILLIAM MULLER,
and C. T. SMITH

The course embraces instruction in (1) communications, including mail handling, telegrams, messenger service; (2) records management, including planning of procedure in records units, subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment, and filing materials.

ENGLISH FOR LETTERS AND REPORTS

418. Practical English Usage (2)

M 6-8. \$12. Repeated in Spring

HELEN W. WILLIAMS

This course enables students through practice to master the fundamentals of correct English. Troublesome problems of English usage, sentence structure, choice of words, style, and grammar, are studied as aids to clear and forceful writing of letters, memoranda, and reports.

419. Vocabulary Building (2)

M 6-8. \$12. Repeated in Spring

SALLIE M. PEASE

Designed to help writers and speakers express ideas clearly and attractively. It embraces word study and selection, diacritical markings, synonyms and antonyms, prefixes and suffixes, usage exercises, and other means of developing a broad and useful command of words.

420. Government Letter Writing (2)

Tu 6-8. \$12. Repeated in Spring

VERNE L. SAMSON

Accurate, clear, concise, courteous letters from Government agencies to citizens are a practical contribution to efficiency and economy in Government. This course gives students an opportunity to work out the principles of writing effective letters. Practice in writing and in class discussion of fundamental principles of writing covers the analysis of incoming letters and planning, drafting, and revising replies. Troublesome questions of grammar, idiom, sentence construction, and paragraphing are discussed.

421. Workshop in Effective Government Writing (2) Spring
(See Language and Literature for other course in English, Writing and Editing)

VERNE L. SAMSON

SECRETARIAL PRACTICES

425. Secretarial Practices (2)

Tu 6-8. \$12

MILDRED R. STEPHENS

Principles and methods of secretarial practices, developed by lecture, discussion, and consultation with experts, to qualify secretaries and stenographers to do better and more responsible work. Part of each session is devoted to discussion of actual problems and helpful suggestions presented by members of the class.

Prerequisite: Stenographic experience or consent of instructor.

426. Advanced Secretarial Practices (2) Spring

ALICE COFFMAN

SHORTHAND

These courses are designed to furnish Federal employees an opportunity to follow a program of training for stenographic careers in the Federal service. While each course represents a separate unit of study, with emphasis on material used in the Federal service, the proper sequence of courses insures a sound foundation for successfully qualifying for the various grades and classifications of stenographers in the Federal service.

Gregg courses designated "functional" differ from other courses in the method of study. The functional method is the reading approach; familiarity with the outlines of the system is gained by reading and writing a large volume of graded material. The standard, or manual, method is the traditional method of studying the principles for writing the outlines, practicing the outlines, and reading and writing them from dictation. Under each system home study is required to attain goals set in course descriptions. Amount of study required varies according to the learning habits and individual goals of students.

Students finishing the beginning functional class may continue with intermediate functional or take a manual theory review. Either "Intermediate Functional" or "Gregg, 70 to 100 Words" will serve equally well as rapid review for the student who has not applied his shorthand knowledge for a long time, or has used it so little that he feels uncertain about applying his knowledge to practical office dictation. Because the "Gregg, 100 to 130 Words" course is an intensive course on technical material, students should have a sound foundation in theory and be able to write 100 words a minute with a 95 percent accurate transcript before registering for this course.

As a general guide to assist employees who wish to plan a course of study to build for a stenographic or stenographic-reporting career in the Federal service the following parallels are drawn:

<i>Course</i>	<i>Goal</i>	<i>Prerequisites</i>
I. BEGINNING GREGG (Functional) BEGINNING GREGG (Manual)	Knowledge of theory, with writing ability of 80 words a minute on familiar material	For those who have not studied shorthand, or for those who have some knowledge of shorthand but have not completed a theory course
II. INTERMEDIATE GREGG (Functional) GREGG, 70 to 100 words PITMAN, 70 to 100 words	Theory review; 80 to 100 words a minute on new, standard material	For those who have completed a course in I or an equivalent theory course, or for those who have lost writing facility through limited use or long disuse
III. GREGG, 100 to 130 words PITMAN, 100 to 130 words	Ability to take difficult dictation at rapid rate; to record full secretarial report of conferences; and to record telephone conversations	For those who have completed a course in I and II or equivalent theory and dictation courses, and who have a minimum speed of 100 words on new, standard material
IV. GREGG, 150 to 175 words	Recording of conferences, hearings, 50 percent verbatim (or more); beginning reporting	For those who have qualified on 140 standard word test
V. GREGG, 175 words and up	Verbatim reporting	For those who have qualified on 175 word standard test or 160 word test plus additional experience and training

Indicate Section when Registering

429. Beginning Gregg (Functional) (3)

Sec. I. M-Tu-Th 6-7. \$18. Repeated in Spring
Sec. II. M-Tu-Th 7-8. \$18. Repeated in Spring

ANNA C. BOLTON

- 428. Beginning Gregg (Manual) (3)**
 Tu-W-F 6-7. \$18. Repeated in Spring NAOMI H. EVANS
- 430. Intermediate Gregg (Functional) (3)**
 Tu-Th 6:30-8. \$18. Repeated in Spring ARTHUR S. PATRICK
- 431. Gregg, 70 to 100 Words (2)**
 Tu 6-8. \$12. Repeated in Spring ALICE COFFMAN
- 433. Pitman, 70 to 100 Words (2)**
 Tu 6-8. \$12. Repeated in Spring LOUISE C. BARRY
- 432. Gregg, 100 to 130 Words (2)**
 W 6:30-8:30. \$12. Repeated in Spring ARTHUR S. PATRICK
- 434. Pitman, 100 to 130 Words (2)**
 F 6-8. \$12. Repeated in Spring LOUISE C. BARRY
- 435. Reporting—Gregg, 150 to 175 Words (4)**
 M-W 7-9. \$24. Repeated in Spring JACK ROMAGNA
- 436. Advanced Reporting—Gregg, 175 Words and Up (4)**
 Spring
 JACK ROMAGNA
- 438. Shorthand in Spanish (2)**
 Tu 6:30-8:30. \$12 GRACE M. BAUER
 An elementary course covering basic principles and outlines of Spanish Gregg Shorthand Manual and progressive dictation in Spanish through supplemental exercises and business correspondence; emphasis on accuracy.
 Prerequisite: Knowledge of Spanish.
- 439. Advanced Shorthand in Spanish (2) Spring**
 GRACE M. BAUER

Department of Physical Sciences

DEPARTMENTAL COMMITTEE

- CHARLES E. KELLOGG, Ph.D., Chief, Division of Soil Survey, Bureau of Plant Industry, Soils, and Agricultural Engineering (Chairman)
IRVINE T. HAIG, Ph.D., Chief, Division of Forest Management Research, Forest Service
ORVILLE E. MAY, Ph.D., Chief, Bureau of Agricultural and Industrial Chemistry
A. K. SHOWALTER, A.B., Meteorologist in Charge, Hydrometeorological Section, Weather Bureau
HAZEL K. STIEBELING, Ph.D., Chief, Bureau of Human Nutrition and Home Economics

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Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figures in parenthesis following the course title indicate number of semester credits.

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[144.] History of Science

PAUL R. HEYL

[145.] Navigation

JOHN T. LOKERSON

[146.] Piloting

CHEMISTRY

147. General (Inorganic) Chemistry (2 each semester)

F 6-8. \$12

ROSCOE H. CARTER

Refresher course designed for students who desire a general knowledge of the subject and those who wish to bring their knowledge up to date. Aim of the course is to give students a better comprehension of the chemical aspects of our environment. The course consists of a series of lectures covering the concepts, principles, facts, and applications of general chemistry. Some organic chemistry is included. No individual laboratory work.

148. Organic Chemistry (2 each semester)

Th 6-8. \$12

C. VERNE BOWEN

Fundamental principles of general organic chemistry are reviewed. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries are correlated with the development of the subject, and emphasis is placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester is devoted to consideration of the aliphatic series; the second semester to the aromatic and heterocyclic series. Recent progress in the chemistry of sterols and vitamins is given.

Prerequisite: One year general chemistry.

[] Not given 1944–45.

149. Physical Chemistry (2 each semester)

Tu 6-8. \$12

WALTER J. HAMER

Fundamental laws of chemical reactions; factors involved in determination of extent, duration, and speed of chemical reactions. Effect of heat and of light of different wave lengths on chemical reactions; properties and structure of gases, liquids, crystals, amorphous substances, colloids, and solutions in relation to their chemical behavior. Other topics include chemical equilibria, atomic and kinetic theories, the phase rule, isotopes, radioactivity, electronic theory of valence, general physicochemical laboratory methods, and electrochemistry including a study of electrode potentials, polarization and electrolysis.

Prerequisites: One year general chemistry; one year calculus; or permission of the instructor.

522. Physiological Chemistry (2 each semester)

W 6-8. \$14

HERBERT O. CALVERY

Lecture course on principles of biochemistry. It deals with the chemistry of proteins, fats, and carbohydrates, general chemical composition of animal tissues, e.g., muscle, nerve, milk, and blood; brief discussion of enzymes of the gastro-intestinal tract; digestion and absorption of principal foodstuffs; metabolism of proteins, fats, and carbohydrates; mineral metabolism; chemical constituents of urine; and general discussion of the chemistry and physiology of the vitamins and hormones concludes the course.

Prerequisites: One year general chemistry; one year organic.

532. Geochemistry (2)

W 6-8. \$14

HARDEE CHAMBLISS

After a brief review of pertinent principles of geology, physics, and chemistry, the discussion will be primarily concerned with the sources of our information concerning the outer shell or crust of the earth; its chemical composition; the interrelation between physical and chemical forces underground; movements and migrations of materials; the occurrence and distribution of subsurface deposits and accumulations of economic importance; the geological horizons and structures in which such materials are found; present-day theories concerning the genesis of ores and minerals and the contributions of chemistry and physics to the solution of problems involved in locating oil, gas, and other accumulations and deposits. One or more field demonstrations of the use of geophysical methods and instruments in underground exploration will be included in the course.

Prerequisites: At least one year of college chemistry, plus a year of college physics or geology, preferably both.

762. Electrochemistry (2 each semester)

W 6-8. \$14

WALTER J. HAMER

Lecture course on fundamentals of electrochemistry. It deals with a study of coulometers, laws of electrolysis, electrolytic conductivity transference numbers, mechanism of galvanic cells, electrode potentials, potentiometric and conductometric titrations, polarograph, diffusion currents, electrokinetic phenomena including electrophoresis and electro-osmosis, ionization constants, determinations of pH or hydrogen-ion activity, and the passivity and overvoltage of electrodes. Problems involved in deposition and corrosion of metals, and factors involved in electroplating, electrodialysis, electropolishing, and in electrolytic oxidation reduction are studied briefly.

Prerequisites: One year general chemistry; one semester of physical chemistry, or consent of the instructor.

Glass Blowing

(See Engineering and Mechanical Arts 188)

GEOGRAPHY AND GEOLOGY

[150.] Physiography of the United States

C. F. STEWART SHARPE

[151.] Geography of the Pacific Islands

F. RAYMOND FOSBERG

[168.] Physical Climatology and Geography

LYLE R. FLETCHER

Economic Geography*(See Social Sciences 613)*

METALLURGY

152. Principles of Physical Metallurgy (2)

W 8-10. \$12

BLAKE M. LORING

Development, meaning, and use of equilibrium diagrams for binary alloys. Iron-carbon diagrams and their relation to cast iron and steel, and to the critical points important in heat-treating ferrous alloys. Steel-treating processes depending on non-equilibrium conditions, including the S-curve. Alloy steels. Aging and precipitation hardening. Segregation and other ingot defects. Mechanical and physical tests, including the interpretation of micrographs. Non-ferrous alloys of industrial importance.

525. Production Metallurgy (2)

W 6-8. \$14

BLAKE M. LORING

The winning of metals from ores beginning with iron and steel. Blast furnace, open hearth, and Bessemer reactions. Influence of methods of manufacture on final properties. Non-ferrous metals including copper, lead, zinc, gold and some of the minor metals. Latest methods of concentration, roasting, smelting, refining, and electrolytic deposition. Chemical and physical principles as well as practices are stressed.

526. Advanced Physical Metallurgy (2) Spring

BLAKE M. LORING

540. Engineering Alloys (2) Spring

BLAKE M. LORING

SOIL SCIENCE

156. Soil Conservation (2)

F 6-8. \$12

J. GORDON STEELE

Physical aspects of soil conservation problems. Extent, causes, and results of soil erosion. Physical capability of land for use. Soil-erosion control, including the need for a wide variety of technical practices and measures brought together in a farm conservation plan. Soil conservation research and operations in the main physical and agricultural regions of the United States.

[] Not given 1944-45.

157. Soil Fertility (3)

W-F 6-7:30. \$18

J. K. ABLEITER

Factors that determine the fertility of the soil and its response to fertilization, liming, green manuring, and other practices are developed. Attention is given to the determination of fertilizer needs and the use of fertilizers in relation to soil conditions, crops grown, and the development of a management system on the individual farm. The properties and use of commercial fertilizer materials and mixtures are discussed.

[531.] Soils: Their Morphology, Genesis, and Classification (3)

CHARLES E. KELLOGG

[767.] Seminar: Soils and Planning

CHARLES E. KELLOGG

METEOROLOGY

With the growing importance of aircraft operations in military and civilian activities, meteorology is undergoing a rapid expansion. Before proceeding on his flight, the pilot must consult the meteorologist regarding upper-air winds, cloud ceiling, threat of icing and thunderstorms, etc., along his route. Opportunities for employment of meteorologists have expanded greatly recently and it is expected that this tendency will continue in the future.

The course in Elementary Meteorology is intended for persons who desire a general outlook in meteorology and who are not interested in becoming professional meteorologists. The remaining courses are intended to give a fundamental and comprehensive meteorological background for persons interested in pursuing a career in meteorology. It is suggested that the courses be taken in the general order in which they are listed.

A course in Introductory College Physics is offered for those who need it as a foundation for study in meteorology (see Physics 153).

162. Principles of Meteorology (2 each semester)

Tu 6-8. \$12

CHARLES B. JOHNSON

A course of a descriptive nature explaining the principles of meteorology essentially on a non-mathematical basis. Especially adapted to preparation for sub-professional employment in the Government and to obtaining the basic meteorological knowledge required of a civilian pilot.

159. Physical and Synoptic Meteorology (2 each semester)

M 6-8. \$12

ALEXANDER L. SHANDS

A course designed for those interested in a career in meteorology. Among the topics covered are: composition and structure of the atmosphere; adiabatic processes; general circulation; air masses and fronts; cyclones and anticyclones; fog; hurricanes; thunderstorms; weather forecasting. Problems involving fundamental units and graphic manipulation are assigned.

[] Not given 1944-45.

163. Comparative Meteorology and Oceanography (2)

W 6-8. \$12

WOODROW C. JACOBS

Fundamentals of oceanography, using these and basic work in meteorology, in a study of world weather and climate. Aeronautical aspects of climatology are given special attention. Topics include: the physical properties of sea water, radiation and heat balance of the earth; general and special circulations of the atmosphere and oceans, evaporation and the hydrologic cycle, interactions between sea and atmosphere, air mass climatology, bases for a dynamic climatology, microclimatology, analysis and presentation of meteorologic data and discussions of the regional and time variations in the structure of the atmosphere, winds, salinity, temperature, fog, clouds, visibility, and precipitation.

Prerequisite: Basic course in elementary meteorology or consent of instructor.

529. Weather Analysis and Forecasting (3 each semester)

M-W 6-8. \$21 plus \$3 laboratory fee

A. K. SHOWALTER and
CHARLES H. PIERCE

Lectures and laboratory. This two-semester course is the natural sequel to Physical and Synoptic Meteorology and provides practical experience in the analysis of various weather charts of sea level and the upper air. Considerable practice is given in preparing weather forecasts from various sea-level, upper-air and local surface data.

Prerequisite: Physical and Synoptic Meteorology or equivalent, or consent of instructor.

534. Introduction to Dynamic Meteorology (2 each semester)

Th 6-8. \$12

JAMES E. WALSH

Designed to illustrate the use of higher mathematics and physics in the interpretation of meteorological phenomena, and in the development of forecasting techniques.

Prerequisite: Physical and Synoptic Meteorology or equivalent, calculus, or consent of instructor.

527. Elementary Statistical Analysis for Meteorologists (2 each semester)

Th 6-8. \$14

HERBERT C. S. THOM

This two-semester course is designed especially for meteorologists and hydrologists. Emphasis will be placed on tests of significance and the exact understanding of definitions and terms. Some emphasis will also be given to the applications of statistical analysis and the limitations involved. Problems will, whenever possible, apply to the fields of meteorology and hydrology. Numerous references to the literature will be furnished for those who desire more elaborate mathematical discussions.

Prerequisite: College algebra or equivalent.

[155.] Elementary Synoptic Weather Analysis

A. K. SHOWALTER and W. M. ROWE

[158.] Elementary Meteorology

CHARLES B. JOHNSON

[160.] Meteorological Instruments and Observation**[161.] Preparation of Meteorological Charts**

[] Not given 1944-45.

[164.] Hydrology (2)

F. F. SNYDER

[533.] Advanced Hydrology (2)

F. F. SNYDER

[537.] Physical Climatology and Geography (2)

[765.] Dynamic Meteorology

PHYSICS

153. Introductory College Physics (3 each semester)

Tu-F 6:30-8:30. \$18 and \$3 laboratory fee

RALPH B. KENNARD

This course is intended for those having no previous knowledge of the subject, and for those who wish to review the elements. The class meets in the well-equipped laboratory of Wilson Teachers College.

First semester: Mechanics—heat—sound.

Second semester: Electricity—light—electronics.

530. Introduction to Hydrodynamics (2)

F 6-8. \$14

MARTIN A. GARSTENS

Introduction to fundamentals of hydrodynamics. Treatment will be vectorial; a short introduction to vector methods is given. Subject matter covered includes: Euler's equations, equation of continuity, Bernoulli's formula, potential motion, sources and sinks, Cauchy-Riemann equations, stream functions, vortex motion, Navier-Stokes equations for viscous fluids, laminar and turbulent flow, boundary layers. Application to related fields such as aeromechanics, meteorology, etc., is made.

Prerequisite: Differential and Integral Calculus; College Physics.

[] Not given 1944-45.

Department of Public Administration

DEPARTMENTAL COMMITTEE

LEON O. WOLCOTT, LL.B., Liberated Areas Branch, Foreign Economic Administration (Chairman)

H. DEAN COCHRAN, B.S., Chief, Division of Personnel Management, Forest Service

VERNE B. LEWIS, M.A., Assistant to the Director of Finance, Office of Budget and Finance (on military leave)

JOHN THURSTON, Ph.D., Administrative Council, USDA

DEWITT C. WING, Senior Information Specialist, Office of Information

OPPORTUNITIES FOR STUDY AND WORK

The modern state truly is as its officers are. Competence of personnel, especially managerial personnel, is an urgent present need and an obvious post-war imperative. Assuring and adding to that competence is the sole objective of the Graduate School.

The importance of public administration is apparent in the modern state with its emphasis on services, control, operation, and collective action in the public interest. The more the public service is called upon to assume functions previously exercised by individuals or private enterprise, the greater the importance of the principles and techniques of public administration. The unprecedented and increasing delegation of discretion to administrative agencies has raised unprecedented problems of organization, public consent, and administrative responsibility.

Washington is of necessity the national focal point of all these developments. Many of the ablest and most experienced public administrators are assembled in Washington. Many of the most competent practitioners of the various specialized branches of administration are likewise concentrated in Washington. Utilizing this unique environment and this unexcelled talent, the Graduate School offers courses geared to demonstrated needs and taught by experienced administrative personnel.

Management problems raised by the war, and aggravated by leave of administrative personnel for military duty, have created an unparalleled demand for trained men and women in all branches of administrative management. The situation has resulted in recruitment of persons from private industry, appointment of persons not so well trained and experienced as in normal times, and the promotion in some cases of meagerly trained personnel at an unusual rate. This is obviously not a normal situation, but it nevertheless illustrates the critical need for more and better training in public administration, particularly in the junior and assistant positions, even in normal times.

SUGGESTIONS FOR PROGRAM OF STUDY

The following courses cover a wide range of approaches for varying levels of responsibility. Some give background and attitude, and some give methods and skill. Some have their objectives high and broad for perspective and knowledge of relationships; some have their objectives comparatively narrow and sharply focused for skill and ability to perform particular tasks. It is hoped that students will select those courses which supplement and complement their work assignments rather than concentrate exclusively on more intensive training in the performance of daily tasks.

General. Persons who have not had such a course, or varied administrative experience, should begin with Introduction to Public Administration. This course and other basic work should precede courses in special branches of administration (e.g., personnel or financial administration) in order that such courses may be of maximum usefulness.

Personnel Administration. Unless substantial experience can be substituted, the general course, Personnel Administration, should be taken before the specialized courses (such as Position Classification, Selection and Placement, etc.). Persons who are in positions classified as Grade CAF-5 or below and desire to prepare for personnel work should take Federal Personnel Procedure at the earliest opportunity; they should not attempt to take the specialized courses until they have gained substantial experience in personnel work or have carefully laid a foundation by completing all basic, general courses.

Financial Administration and Purchasing. Budget Formulation logically precedes Budget Execution. In purchasing, students qualified to work toward the program for a Certified Statement of Accomplishment in Public Administration should take Governmental Purchasing. It is desirable for other students to take Purchasing Procedure first.

Accounting and Auditing. Students in classification grades below CAF-5 will find it advantageous to begin with Federal Accounting Procedure or Federal Auditing Procedure. Preparation for higher-level accounting should begin with a year's study of Principles of Accounting, after the completion of which Federal Government Accounting may be taken. Second Year Accounting, Cost Accounting, Auditing, Federal Tax Accounting, Advanced Accounting Problems, and Analysis and Interpretation of Financial Statements provide advanced training for those who desire to progress further with a general accountability program. (See program below for Certified Statement of Accomplishment.)

CERTIFIED STATEMENTS OF ACCOMPLISHMENT

Certified Statements of Accomplishment are offered in two fields of public administration—fields representing areas of preparation and application most useful in the public service—and in accounting.

The student who completes one of the programs outlined below is eligible to receive a Certified Statement of Accomplishment bearing the official seal of the School and signed by the Director of the School and by the Chairman of the Department of Public Administration. The Statement is not merely a diploma-like certificate nor simply a transcript of credit, but combines certain features of both. It is a certification that the student has completed a well-rounded course of study preparatory for effective public service in (1) administrative procedures, (2) public administration, or (3) accounting. Courses completed and quality of accomplishment will be recorded on the back of the Statement, which may be used as a personal record of achievement or a public record of qualification.

Certified Statements of Accomplishment are offered in the three fields described below.

I. PUBLIC ADMINISTRATION

Approach

Broad-gauge, essentially long-range approach to develop leadership, perspective, broad outlook, and understanding of the human factors in administration; emphasis on principles, with opportunity for study of some techniques in relation to policy.

Objectives

Ultimately, for policy formulation, improvement of administrative machinery, coordination of operations, and general management and control of large units. Immediately, for initial investigations as a junior member of a staff having the responsibilities named above, for assumption of increasingly difficult and more responsible assignments in these fields, and for supervision and management of small units.

Requirements

1. Bachelor's degree or equivalent. (Note: This requirement may be waived in the case of well-qualified students who have received a Certified Statement of Accomplishment in Administrative Procedures.)
2. Sixteen semester hours of credit in Graduate School courses in public administration, with at least four credits in each of the following fields:

- a. General Administration (courses in introductory public administration, Federal administrative management, scientific management, organization, administrative law, public relations, management psychology, etc.).
- b. Personnel Administration (courses in introductory personnel administration, position classification, selection and placement, counseling, training, employee relations, etc.).
- c. Financial Administration (budget formulation, budget execution, governmental purchasing, governmental accounting, etc.).

The program leading to a Certified Statement of Accomplishment in Public Administration should be of special interest to:

1. Persons already employed in responsible administrative positions. Included in this group are many with specialized training who have been transferred to administrative positions from professional positions without training or previous experience in administration.
2. Junior Administrative Assistants and junior administrative technicians of all kinds.
3. Recently recruited Junior Professional Assistants. Those who entered the service with a public administration option may profit from courses both more advanced and more specialized than those taken in college. Those who entered on various professional options and are now employed in such professions can profit very greatly from these courses if they expect, or wish to prepare, to enter into administrative work connected with their professional fields.
4. Employees who wish to broaden their understanding and improve their efficiency through a "tour of duty" by study, in lieu of an actual tour of duty for which they have found no opportunity.
5. Employees with college background who aspire to transfer to a career in administrative management.

II. ADMINISTRATIVE PROCEDURES

Approach

Emphasis on techniques, procedures, methods, but with an attempt to understand and use these means in terms of administrative ends or objectives.

Objectives

Ultimately, for responsible conduct of important "housekeeping" operations of specialized character, direction of small units,

performance of most difficult and responsible tasks in the procedural aspects of administration, and the settlement of questions of intermediate importance arising out of current or contemplated operations and not covered by existing regulations or decisions.

Immediately, for effective service in some administrative procedure at the clerical or semi-clerical level, as a means of entrance into the line of promotion leading to the responsibilities named above. (Students already at this level may arrange programs in conformity with their needs.)

Requirements

1. High-school diploma or equivalent.
2. Sixteen semester hours of credit selected from the following Graduate School courses:
 - a. All those offered in the Department of Public Administration (excluding all accounting courses except Federal Government Accounting). A minimum of eight credits must be selected from this group.
 - b. The following offered in the Department of Office Techniques and Operations:
 - (1) Administrative Procedure
 - (2) Purchasing Procedure
 - (3) Federal Auditing Procedure or Auditing Procedure
 - (4) Federal Accounting Procedure
 - (5) Federal Personnel Procedure
 - (6) Office Management
 - (7) Records Management Procedure, formerly called Communications and Records Management
 - (8) Government Letter Writing (2 credits only)
 - c. A course in elementary statistics (3 credits)

The program leading to a Certified Statement of Accomplishment in Administrative Procedures should be of special interest to:

1. Persons already employed in administrative work of the procedural type, emphasizing techniques and skills.
2. Employees who aspire to enter administrative work but who, because of lack of college education, find their opportunities in that field greatly limited except at the procedural level. This program of courses is useful for persons with good native ability but limited educational background, because it pre-

pare them for a level of work most likely to be open to them. After they have succeeded in getting into administrative work, perhaps even at the clerical-administrative level, they can then combine their work-experience and study-experience to mutual advantage as progress is made toward greater responsibility. This approach is believed to be better for such persons than the common practice of attempting to circumvent the usual educational requirements by shortcut concentration on advanced and specialized courses, which are actually preparatory for responsible positions only insofar as they *supplement* broader educational background.

3. Employees who wish to prepare to become Junior Administrative Assistants or to head units concerned with administrative procedures.

III. ACCOUNTING

The Graduate School is interested in offering accounting courses primarily as a means of training for the *public* service. For many years the School has offered elementary and advanced accounting courses; and because of increasing demands for advanced work, it is now offering a coordinated program leading to a Certified Statement of Accomplishment in that field.

The curriculum necessarily includes courses in general accounting because the basic principles are essential for government accounting. The scope of accounting in the Federal service is wide. There are increasing demands for accountants having a knowledge of commercial as well as government accounting. These demands have come as a result of the formation of many government corporations and Federal regulatory agencies. Hence, the accounting program required for a Certified Statement of Accomplishment is broad enough to cover not only the regular appropriation accounting of the Federal Government, but also the accounting training needed for many other governmental activities. The program is comprehensive enough to meet both advanced training for the government service, and also the usual educational requirements for C.P.A. examinations.

Requirements

1. High-school diploma or equivalent.
2. Forty-two semester hours of credit distributed according to the following plan:

REQUIRED COURSES

<i>Accounting</i>	<i>No. of Semesters</i>	<i>Credits (Sem. Hrs.)</i>
Principles of Accounting	2	6
Second Year Accounting	2	6
Cost Accounting	1	3
Auditing	1	3
Federal Government Accounting (Optional for persons not planning to enter Federal accounting work)	1	3
Federal Tax Accounting	1	3
Advanced Accounting Problems	1	3
<i>Related Subjects</i>		
Principles of Economics	2	6
Business Law *	2	6

ELECTIVE COURSES

Analysis and Interpretation of Financial Statements	1	2
Mathematics of Finance	1	3
Budgetary and Financial Administration	2	4
Survey of Statistics	1	3
or Elementary Statistics	2	4
Federal Accounting Procedure	1	2
Federal Auditing Procedure	1	2
or Auditing Procedure	2	4
Public Finance and Taxation *	1	3
Money and Banking *	1	3
Corporation Finance *	1	3

* *Cooperative with American University.*

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Course Numbers and Symbols—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Figures in parenthesis following the course title indicate number of semester credits.

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GENERAL ADMINISTRATION

344. Introduction to Public Administration (3)

M 6:30-9:30. \$18. Repeated in Spring

JOHN C. RUSSELL

This course is designed to introduce the student to the elements of public administration. Attention will be devoted to the evolution of administrative

organization; organizational types: staff, line, and auxiliary agencies and functions; controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; budgeting and fiscal control; federal-state relations; administrative legislation and adjudication. The object of the course is to lay a broad foundation for more intensive courses in management.

626. Federal Administrative Management (2)

W 6:30-8:30. \$14. Registration limited to 15

WARD STEWART

An advanced seminar designed to aid persons who are carrying substantial administrative management responsibilities. Emphasis is placed upon the integration of all management functions and the development of a philosophy of management which is equally applicable to all phases. Lectures and discussions cover the following general topics, with particular attention to their interrelationships and interdependence; administrative planning and research; principles of organization; personnel selection, placement, training, and relations; administrative leadership, direction, supervision, and coordination; administrative reporting; budget formulation and execution; the auxiliary management services. Practical problems presented by class members for group discussion.

Prerequisite: Introductory course in public administration plus practical working experience in administrative management at level of CAF-9 or above.

617. Administrative Law and Procedure (2 each semester)

W 6-8. \$14

CHARLES B. NUTTING

Consideration given to the following subjects: disposition, delegation, and sub-delegation of governmental powers; limitations upon administrative discretion; regulatory procedures (including hearings) of Federal administrative agencies in general and of the Department of Agriculture in particular; recent and current proposals for revision of Federal administrative procedure; and judicial review of administrative action. To the extent possible, administrative procedures of some of the war agencies also are examined.

Prerequisites: Practical experience in a major regulatory activity of the Federal Government or extensive academic training in public administration or public law.

624. Organizational and Procedural Analysis (2)

Th 6-8. \$14

JOSEPH POIS

Deals with techniques employed in analysis of organizational and procedural problems and in the formulation of recommendations for the solution of such problems. Considerable emphasis is placed upon the different sets of circumstances encountered in the course of such analytical work. Specific case studies are presented for discussion. Admission to the course is restricted to persons who have had several years' administrative experience.

Prerequisite: Consent of instructor, through Graduate School office.

624B. Advanced Organizational and Procedural Analysis (2) Spring

JOSEPH POIS

618. Management and the Worker in the Public Service (2) Spring

WARD STEWART

623. Scientific Management (2) Spring

ROBERT J. SCHUBACH

[621.] Federal-State Collaboration**[625.] Psychology of Management (2)**

RENSIS LIKERT

Administrative Procedure

(See Office Techniques and Operations 408-409)

PERSONNEL ADMINISTRATION

661. Personnel Administration (2)

M 6-8. \$14. Repeated in Spring

WALLACE SAYRE

Deals with personnel problems which arise when people are associated together in a work situation. It is designed to acquaint the student with the basic personnel policies and practices found necessary and useful in coping with these problems. Trends in public personnel administration and its relationship to over-all management are discussed. The course will be helpful to supervisors and administrators who desire a broad understanding of personnel administration and also to students who need foundation for the more specialized courses in the personnel field.

842. Personnel Administration (2)

M 6-8. \$14. Repeated in Spring

LOUIS J. KROEGER

A graduate course dealing with the same problems and content described in the undergraduate course listed immediately above.

Prerequisite: Bachelor's degree or employment in personnel work at grade CAF-7 or above.

659. Federal Position Classification (2)

M 6-8. \$14. Repeated in Spring

ROBERT L. HILL

An introductory course designed to give the student an understanding of the fundamental concepts of position classification and its uses; the relation of classification to compensation and other phases of personnel administration; the historical background of position classification in the Federal service; an analysis of the Classification Act of 1923 and its amendments and its relation to other personnel processes; position analysis and factors to be considered in the allocation of positions.

Prerequisite: 60 semester hours of college work or consent of the instructor.

660. Federal Position Classification (2)

Tu 6:30-8:30. \$14. Repeated in Spring

O. GLENN STAHL

Same course as above; limited to college graduates or those employed in classification or other personnel work at grade CAF-7 or above.

627. Advanced Federal Position Classification (2)

M 6-8. \$14. Repeated in Spring

JAMES L. BUCKLEY

A study of the practical administration of the Federal classification plan. Emphasis will be placed on the actual methods, policies, and practices that influence allocation of positions. Specific positions and their allocation factors will be discussed.

[] Not given 1944-45.

630. Selection and Placement (3)

Tu 6:30-9:30. §21. Repeated in Spring

ARTHUR B. McLEAN

Recruiting, evaluation, probation, placement, and promotion of employees, with special reference to the Federal civil service; lectures and discussions.

631. Employee Relations and Counseling (2)

Tu 7-9. §14

CAROLYN L. MCGOWAN

Deals with the organization and operation of a program of employee relations and counseling in the Federal service. Emphasis on methods and techniques of both preventive and remedial employee relations; counseling and dealing with grievances. Organization for and methods of dealing with (1) individual problems of adjustment both to work environment and to off-the-job environment, and (2) group problems and relationships, employee organization and representation, and appeals procedure.

639. Employee Training (2)

F 6-8. §14

MILTON HALL and C. O. HENDERSON

This course is designed to aid those who have the responsibility for training employees or developing in-service training programs. It will treat general content applicable to any Government agency, such as: how the supervisor can do a better job of program planning and training subordinates; how to train for effective-writing programs; how to get employees to use simplest way of doing their work; orientation of employees; how to aid employees to make adjustments to changes brought about by the war and peace.

663. Legal Aspects of Investigations—Criminal Evidence and Procedure (2)

Tu 6-8. §14

RALPH KOEBEL

Designed to provide investigative personnel and those desiring to prepare for such work, a background and insight into the legal aspects of their investigations: what types of evidence to seek; circumstances and conditions under which the evidence is to be obtained in order to have adequate probative value; and how to prepare such evidence for presentation in court or other procedure. Since all investigations are potential sources of prosecution, the requirements of criminal evidence and procedure often reach into the early stages of investigation. The instruction is designed to provide understandable information without overemphasis of technical aspects.

[633.] Advanced Safety Administration (1)**[629.] Tests and Measurements in Personnel Administration (2)****Techniques of Interviewing and Questionnaire Construction**
(See Social Sciences 736)**The Conditions of Personality Growth**
(See Social Sciences 342)**Federal Personnel Procedure**

(See Office Techniques and Operations 414)

[] Not given 1944-45.

PUBLIC RELATIONS

840. Principles and Practice of Public Relations (2)

M 6-8. \$14. Repeated in Spring

DUNCAN WALL

Public relations is approached as an integral part of the administrative process, the purpose of the course being to establish a sound knowledge of the principles of public relations and a basic understanding of its techniques as implements of administration. The course will include study of public relations techniques as applied in public and private administration through the use of the principal media.

Prerequisites: Bachelor's degree; two years of undergraduate work with emphasis on social sciences; or experience related to public relations.

Creative Writing

(See Languages and Literature 224)

Editing

(See Languages and Literature 225)

Writing for Official Purposes

(See Languages and Literature 226)

Workshop in Effective Government Writing

(See Office Techniques and Operations 421)

BUDGETARY ADMINISTRATION

635. Budgetary and Financial Administration: Budget Formulation (2)

Th 6-8. \$14

W. A. JUMP and SPECIALISTS

First part of an advanced, two-semester program covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureau and department budget offices, and other budgetary and financial organizations will lecture and lead discussions.

The course deals with the pre-appropriation phases of budgeting, including formulation, review, and congressional enactment of the budget. Topics discussed include: history, development, and purposes of budgeting in the United States and other countries; Federal budgetary and fiscal policies in relation to the national economy; the role of budgeting in program formulation; the role of bureaus, departments, Bureau of the Budget, the President and Congress in budgeting; budgetary procedures; content of the Budget; the investment and capital-outlay budgets; review and analysis of budget estimates; budget justification; legislative-administrative relationships in budgeting. Each student desiring credit is expected to write a short paper on some problem relevant to the course.

Prerequisites: Experience in budgetary or financial administration, courses in public administration, or consent of instructor.

636. Budgetary and Financial Administration: Budget Execution (2) Spring

W. A. JUMP and SPECIALISTS

PURCHASING

637. Governmental Purchasing (2 each semester)

F 6-8. \$14

S. A. SNYDER and J. K. KNUDSEN

This course is primarily designed for employees who are or desire to be engaged in purchasing activities for the Federal Government and persons who sell goods and services to the Government. It deals with the procedure, economics, and law (from a layman's viewpoint) relating to such purchasing. Among the topics considered are: the organization and management of purchasing offices and Government warehouses; the nature of public contracts and how they differ from private contracts; specification writing; the analysis of market conditions with reference to Government purchasing; the effect of numerous laws such as the Walsh-Healy Act, the Bacon Davis Act, and the Eight Hour Law; the place and functions of the General Accounting Office and the Procurement Division in the purchasing scheme; and practices under wartime conditions, including a review of the war powers relating to purchasing, renegotiation, termination, and cost-plus-fixed fee contracts. Leading specialists will be invited to discuss selected technical phases.

The course is so arranged that attendance at either semester will add to the student's knowledge and credit will be given on a semester basis. No subject matter, however, will be repeated. The full course covers two semesters.

638. Government War Contracts (2)

W 6-8. \$14

JAMES R. WILSON

Deals with the various types of Government war contracts and the more important factors, legal and economic, that affect the making and performance of such contracts. Renegotiation, contract termination, and surplus property disposition will be given the greatest consideration. Latest legislation and administrative practices in these fields will be studied and analyzed.

Federal Purchasing Procedure

(See Office Techniques and Operations 415)

ACCOUNTING

See page 53 for a suggested program of study and for the requirements for a Certified Statement of Accomplishment in Accounting.

352. Principles of Accounting—First half (3)M-W 6-7. \$18. Repeated in Spring
Laboratory M 7-9 beginning Oct. 2W. H. ROWE, WILLIAM K. BROWNOLD
and PAULINE W. BERRUM

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to do the accounting necessary for a small business organization; i.e., keep a complete set of books, draw up statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

352. Principles of Accounting—Second half (3)Tu-Th 6-7. \$18. Repeated in Spring
Laboratory Tu 7-9 beginning Oct. 3

JOHN F. MCSHEA

Continuation of first half covering more advanced principles of accounting; accounting for partnerships, corporations and manufacturing; depreciation policies and analysis of financial statements.

353. Second Year Accounting (3 each semester)

M 6-9. \$18

ALLAN J. FISHER

First semester: Advanced principles of manufacturing accounting, corporation accounting, and valuation as applied to current assets, fixed assets, intangibles, and liabilities, reserves and funds, installment sales.

Second semester: Advanced principles of partnership accounting, including formation, operation, and dissolution; joint ventures; consignments; agencies and branches; consolidated balance sheets and income statements; application of funds; accounting for insolvent and bankrupt concerns; estates and trusts.

Prerequisite: First year accounting or equivalent.

354. Federal Government Accounting (3)

W 6-9. \$18. Repeated in Spring

W. R. QUIGLEY and CHARLES N. MASON

A review of the development of the accounting system for Federal funds and a detailed study of appropriation, fund, receipts, and governmental corporation accounting. Special emphasis is given to the accounting problems of administrative agencies. The Treasury Department and General Accounting Office relationships to the accounting system are covered. Specialists in their respective fields assist in the course.

Prerequisite: One year of basic accounting or Federal Accounting Procedure, or one year of experience with the Federal system of accounting.

642. Cost Accounting (3)

Tu 6-9. \$21

JOHN J. BACHMANN

A thorough and comprehensive treatment of the principles of cost accounting, together with the methods of their application to specific problems. By means of lectures, textbook study, and problems, full consideration is given to the methods of cost accounting for materials, labor, direct and indirect expenses in their relationship to specific job orders; process, departmental and standard costs; and the control accounts.

Prerequisite: Principles of Accounting.

645. Federal Tax Accounting (3)

Th 6-9. \$21

TO BE ANNOUNCED

Federal taxation presented from the accounting viewpoint. Special attention given to income taxation. It is desirable that those admitted to the class have had education or experience in accounting.

647. Analysis and Interpretation of Financial Statements (2)

W 6-8. \$14

TO BE ANNOUNCED

A course designed to give practice and experience in analyzing and interpreting various types of financial statements. Numerous analytical devices will be used in the endeavor to draw from such statements the maximum amount of financial and economic information, with emphasis on meaning and significance rather than on mechanics. The limitations as well as the uses of data will be recognized.

Prerequisite: One year of accounting.

643. Auditing (3) Spring

JOHN J. BACHMANN

[646.] Advanced Accounting Problems**Federal Accounting Procedure**

(See Office Techniques and Operations 412)

[] Not given 1944-45.

Department of Social Sciences

DEPARTMENTAL COMMITTEE

- CHARLES F. SARLE, Ph.D., Executive Assistant for Scientific Services, Weather Bureau (Chairman)
ERIC ENGLUND, Ph.D., Chief, Regional Investigations Branch, Office of Foreign Agricultural Relations
ASHLEY SELLERS, S.J.D., Assistant Administrator, War Food Administration
CONRAD TAEUBER, Ph.D., Statistical Analyst, Office of the Chief, Bureau of Agricultural Economics
FREDERICK V. WAUGH, Ph.D., Chief, Program Analysis and Appraisal Branch, Office of Distribution

PURPOSE AND SCOPE

Social science deals with *people* and the problems of human relationships, as contrasted with natural or physical science which deals with *things* and the problems arising out of physical relationships.

The problems of social organization and operation have become both absolutely and relatively more important with the increase in complexity of our industrial civilization. More and more, people are concerned with the organization and regulation of production, the distribution of goods and income, and with price policies. The individual as a consumer and investor, the businessman and the farmer as producers, find increasing need for a knowledge of economics and other social sciences. Large corporations are employing growing numbers of economists to help in the formulation of policy. Psychologists and social workers are finding a demand for their services in personnel work. And, the tremendous growth in Federal, state and local government organization calls for many more people adequately trained in social science.

Social science is divided into a number of closely allied fields including economics, sociology, political science, history, law, and psychology. A broad grasp of any one of these subjects implies at least some familiarity with the others, because of the many interrelationships among these social studies. Yet the continued development of each social science has given rise to larger and still larger bodies of knowledge relating to it, until only through a considerable degree of specialization can the student hope to master any one part. Thus the great need is for people who have concentrated sufficiently on one phase of a social science, such as money and banking in economics, to be thoroughly familiar with the details of fact and principles involved, yet who also have a broad underlying training in the allied social science fields. The courses offered by the Graduate School are designed to aid in acquiring such a general background in the social sciences, as well as the spe-

cialized training in particular fields which is necessary for successful work in many Government departments and in private business.

Not all of those engaged in occupations connected with the social sciences, however, can hope to attain such a complete general as well as specialized background, at least for some time to come. They will be interested, rather, in courses designed to fit them better for doing some specific job which is not connected with policy formation or general administration. An employee in the personnel office of a Department of Agriculture Branch responsible for market news and inspection services may wish to take a course in Advanced Marketing in order to learn something about the subject matter dealt with by the personnel of the Branch, or a course in psychology as an aid in dealing with the personal problems which are daily presented to employee counselors. The secretary to an economic research director may want a course in the principles of economics in order to become familiar with the terminology and general economic concepts to which her stenographic and filing duties relate. An almost unending array of job needs of this kind offers opportunities to the alert and ambitious employee to increase his capacity and usefulness to his employer. The many promotions within the Government service which can be traced directly to such training testify to the fact that study in the social sciences is profitable.

About half the courses offered in the social sciences deal with economics, including not only courses in theory and principles, but also applied economics in several fields such as agriculture, labor, transportation, banking, taxation, and economic geography. These courses deal with the business side of life; that is, with the science and art of making a living. Special emphasis is given to the analysis of government policies which affect prices, production, and methods of doing business.

Fewer courses are offered in the other specialized fields within the social sciences. The Graduate School believes that all students doing serious work in the other social sciences should have a good grounding in economics. Such students will find several useful and important courses in most of the other fields, but in many cases if they want to specialize in such subjects as sociology, political science, law, history, or psychology they will need to supplement their work in the Graduate School with courses taken in other institutions.

GROWING NEED FOR TRAINED WORKERS

In recent years, governments have been taking a more active part in the regulation of economic and social life. During the war such

controls are necessarily strengthened and increased until they affect almost all economic and social activity. After the war many of these controls doubtless will be relaxed or dropped, but it is quite clear that the underlying trend is not likely to be reversed although there may be temporary counter trends. In this country the State and Federal Governments doubtless will be called upon to carry out a number of broad post-war programs dealing with such matters as processing, production, distribution, taxation, employment, monetary and fiscal policy, the regulation of business practices, and international trade.

It is extremely important that government policies, both during the war and after the war, be based on competent studies. To forecast accurately what will happen and to point out clearly the good and bad effects which may result from any proposed course of action is the major service which social scientists may render the people.

Washington is an excellent place to study problems of this kind. The principal Federal programs in the economic and social fields are administered in Washington and new proposals always are being considered both by the Congress and by the agencies responsible for the programs. Moreover, Washington is growing in importance as a center for the discussion and actual administration of international programs.

SUGGESTIONS FOR PROGRAM OF STUDY

The School offers a rather wide range of courses in the social sciences. This is necessary because of the breadth of the field and the need for a considerable degree of specialization in several of the sub-fields.

All students in the social sciences should have a few general foundation courses. If the student has not already had such courses, he should take them as soon as he begins his work in the social science department.

It is also advisable for most students in this field to know something about statistics. This is not an absolute requirement for all courses in the social sciences, but students will find that a grasp of elementary statistical methods is extremely useful in most studies in this field and is indispensable for many of them.

Most students in the social sciences will want to specialize in some specific field. The courses are arranged to provide such specialization, but students should remember that these sub-fields are not entirely separate and distinct from one another. They will have to avoid two evils—that of overspecializing, and that of getting a smattering of a wide variety of topics within the broad field

of the social sciences. For that reason, students who take a large number of courses in one particular sub-field should also enroll in some of the advanced courses in theory and principles of their particular disciplines and at least a few courses in other specialized fields which are fairly closely related to their own.

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Course Numbers and Symbols—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 700, graduate. Bracketed numbers, not given this year. Asterisk (*) before numbers, may be applied toward resident credit for advanced degree at American University. Figures in parenthesis following the course title indicate number of semester credits.

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ECONOMICS

328. Principles of Economics (3 each semester)

Tu-Th 6-7:30. \$18

FREDERICK L. THOMSEN

An examination of the nature, validity, and significance of the "fundamental principles of economics." The course is designed to give the student the understanding of basic concepts necessary for advanced study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

610. Consumer Cooperation (2)

Tu 6-8. \$14

VALERY J. TERESHTENKO

Analysis of the role consumer cooperation has played in the social and economic life of Europe, Latin America, and in urban life in the United States of America. After brief study of the evolution of the theory of cooperation, attention will be focused on its application in the fields of credit, housing, health, education, etc. Particular attention will be paid to consumer cooperation in Sweden, Switzerland, and Great Britain, to credit cooperatives in Germany and India, to group health associations in Poland and Yugoslavia, and to industrial cooperatives in China. Emphasis will be placed on cooperatives in countries of primary importance to the United States in the post-war period, and on social implications of consumer cooperation in the post-war economy.

692. Econometrics: Mathematical and Statistical Analysis of Economic Problems (2)

M 6:30-8:30. \$14

R. O. BEEN

Application of mathematical and statistical procedures to analysis of problems in economic theory and applied economics occupies a prominent place in contemporary economic literature. Many important modern contributions to

the economic field utilize these procedures and require special training on the part of economists who wish to follow them. It is the purpose of this course to provide the basic part of this discipline, relating mathematics and statistics to economics.

The first third of the first semester will be devoted to review and development of mathematical and statistical methods with special topics discussed later as required. H. T. Davis' *The Theory of Econometrics* will be used as the principal text, supplemented by readings of journal articles and special references. Graphic methods will be stressed. The last part of the second semester will be devoted to discussion of important modern writings including articles in *Econometrica* and *Economica*.

Prerequisites: For graduate credit, economic theory, elements of statistics and mathematics to calculus. For others, at least college algebra and principles of economics.

807. International Financial and Trade Policies (2)

F 6-8. \$14

OSCAR ZAGLITS

The course analyzes problems of international commercial and financial policies, particularly possible patterns of such policies under economic conditions that may prevail in the post-war period. The problems discussed include: free trade versus industrial and agricultural protection; dumping and foreign trade subsidies; trade restrictions by tariff versus trade restrictions by quotas, exchange control, and other administrative devices; efforts of the United States trade policy to secure equality of treatment in the face of regional, empire, and other preferences; bilateral versus multilateral trade; stable versus variable exchange rates; international reconstruction policies after this war (critical analysis and discussion of proposals for international monetary stabilization, world clearing systems, international lending, international commodity agreements, etc.).

The course will be valuable to those who are or may be concerned with international policies (tariffs, foreign trade, foreign agriculture, etc.) or with monetary and financial problems; it will also benefit those who expect to go abroad in the service of the United States Government or other institutions.

*579. Research Methodology in Economics (2) Spring

MICHAEL T. WERMEL

*824. War and Post-War Food Policy (2) Spring

F. V. WAUGH and R. H. ALLEN

[604.] Seminar: The Economies of the Nations of Latin America (3)

CHARLES F. SARLE

[612.] Principles of Insurance (3)

VICTOR H. VALGREN

*809.] Price Analysis (3)

FREDERICK L. THOMSEN

[812.] War and Post-War Financial Problems (2)

FRED L. GARLOCK

[823.] Welfare Aspects of Economic Policy (2)

F. V. WAUGH and R. O. BEEN

[] Not given 1944-45.

Principles of Transportation*(See Transportation and Traffic 337)***Money and Banking¹ (3)**

W 6:10-8:20. \$30

FRITZ K. MANN

Public Finance and Taxation¹ (3)

F 6:10-8:20. \$30

FRITZ K. MANN

Business Cycles and Monetary Theory¹ (3)

Tu 6:10-8:20. \$30

FRITZ K. MANN

National Income and Its Distribution¹ (3)

Tu 8:20-10:30. \$30

MILTON GILBERT

AGRICULTURAL ECONOMICS

***580. Social and Economic History of American Agriculture (3)**

Tu 6-9. \$21

EVERETT E. EDWARDS

The geographical basis of American agriculture; agrarian settlement; land policies; the agricultural revolution, its elements and significance; history and significance of farm implements and machinery; agricultural development by regions and commodities; transportation and marketing agencies promoting agriculture, including individual leadership, societies, fairs, periodicals, State and Federal departments, education, and sciences; farmer movements; agriculture in recent times.

***584. Production Economics (3)**

M-W 7-8:30. \$21

S. E. JOHNSON and W. D. GOODSSELL

This course is planned as an introduction to the course in farm management to be offered in the second semester. It stresses the principles basic to the economic problems of production which are encountered in farm management, land economics, soil conservation, and similar fields. It is aimed at an understanding of the economic basis of agricultural production and the development of principles of production economics and farm accounting as useful tools in analysis of problems with which the student is concerned.

Prerequisite: Principles of Economics or its equivalent.

***585. Farm Management (3) Spring**

S. E. JOHNSON and W. D. GOODSSELL

***586. Land Economics (3)**

Tu-Th 6-7:30. \$21

V. W. JOHNSON

A survey of economic principles governing utilization of major land types, including an appraisal of present land resources and future need for various types of land and land uses, traditional practices and customs that affect land use, private and public land ownership and tenancy relationships, problems of new settlement, land income under different conditions of ownership and management, and of various State and local measures for the direction and control of land use and occupancy.

(¹American University course. See A.U. catalog.)

664. Economics of Rural Welfare (2)

W 6:30-8:30. \$14

RAINER W. SCHICKELE

This course will focus the discussion upon the central issues of rural economic welfare. Its main objectives will be (1) to examine the structure of the rural economy and its relationship to the national economy as a whole; (2) to clarify the economic factors, social relations and institutional arrangements which affect the rural population as a group, nationally, regionally and locally; and (3) to evaluate the effect of major public policies upon rural economic welfare with respect to production and income distribution. Objective criteria for such an evaluation will be derived from the body of modern economic theory and the institutional requirements of a democratic social order.

693. Advanced Marketing (2 each semester)

W 6-8. \$14

S. R. NEWELL

Fall semester. The first half of the course will be devoted to a survey of marketing particularly as it relates to the development of the agricultural marketing services. This will be followed by a more detailed discussion of some of the specific activities, particularly crop reporting, market reporting, standardization and grading activities. Some time will be devoted to the practices and policies relating to administration.

Spring semester. This part of the course will be closely related to the first half but will deal more specifically with some of the important regulatory laws. Some of these are: Pure Food, Drug, and Cosmetic Act, Meat Inspection Act, the Grain Standards Acts, several Cotton Acts, and Commodity Exchange Act. Although some attention will be given to legal aspects, the approach will be from the marketing standpoint and will not be a legal discussion. The marketing implication of some of the more important Acts, such as those mentioned above, will be discussed by specialists in the respective fields.

Prerequisite: Course in marketing or satisfactory experience in this field.

835. Agricultural Cooperation (2) Spring

WARD W. FETROW and HAROLD HEDGES

581. Comparative World Agriculture (3) Spring

CLAYTON E. WHIPPLE

587. Seminar in Land Economics Research (2) Spring

V. W. JOHNSON

[332.] The Department of Agriculture—Its Origin, Structure, and Functions (3)

T. SWANN HARDING

[589.] Cotton Marketing

J. W. WRIGHT

[590.] Warehousing**[688.] Current Land Policies (2)**

V. W. JOHNSON and J. F. TIMMONS

[808.] Principles of Agricultural Marketing

R. O. BEEN and SPECIALISTS

[] Not given 1944-45.

Statistics of Crop Estimating

(See Mathematics and Statistics [737])

Cotton Classing

(See Engineering and Mechanical Arts [191])

War and Post-War Food Policy

(See Economics 824)

LABOR ECONOMICS

***595. Organized Labor and the Law (3)**

M 6-8:30. (18 weeks) \$21

DAVID ZISKIND

This course is designed to develop an understanding of the functioning of law and government agencies in the field of labor relations. It will present an analysis of statutes and judicial decisions on the organization of trade unions, the incidents of union membership, collective bargaining, strikes and lockouts, picketing, boycotts, blacklists, conciliation and arbitration, and trade union responsibility. Attention will be given the administrative procedure of the National Labor Relations Board and the State labor relations boards.

***593. Labor and Social Legislation (3) Spring**

DAVID ZISKIND

[594.] Settlement of Labor Disputes (3)

DAVID ZISKIND

[596.] Labor and the War Program (3)

DAVID ZISKIND

Labor and the Economic Order¹ (3)

W 6:10-8:20. \$30

GUSTAV PECK

ECONOMIC THEORY

597. History of Economic Thought (3 each semester)

M-W 6-7:30. \$21

MAX J. WASSERMAN

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices that conditioned them.

***810. Economics of Imperfect Competition (3 each semester)**

W 7-9:30. (18 weeks) \$21

MICHAEL T. WERMEL

This course will commence with a critical reexamination of basic premises underlying the traditional theory of price determination, as an introduction to an intensive study of newer theoretical techniques, developed recently, for the analysis of prices under conditions that fit neither assumptions of "perfect competition" nor of "pure monopoly" and that have been described as conditions of "monopolistic" or "imperfect" competition. In the second semester, the usefulness and applicability of this theoretical apparatus will be tested by a study of actual institutional practices, of price determination in specific markets in indus-

¹ American University course. See A.U. catalog.)

[] Not given 1944-45.

tries such as rubber tires, agricultural implements, drugs, meat packing, fertilizer, canning, etc., where admittedly neither "perfect competition" nor "pure monopoly" prevails.

*811. Post-War Economic Problems (2)

M 7-9. \$14. Repeated in Spring

MICHAEL T. WERMEL

This course is designed to furnish the necessary theoretical background for the understanding and discussion of plans for post-war economic reconstruction. Such theoretical concepts as gross national product, national income, productivity of labor, hours of work, labor turnover, price trends, wages, fiscal policy, control of prices, international trade, etc., will be discussed. The method of developing economic forecasts or perspectives on the basis of systems of assumptions related to above factors will be examined.

Economic Theory¹ (3 each semester)

Th 8:20-10:30. \$30

HOWARD S. PIQUET

Contemporary Economic Thought¹ (3 each semester)

Th 6:10-8:20. \$30

HOWARD S. PIQUET

ECONOMIC GEOGRAPHY

613. Economic Geography (3)

M-W 6-7:30. \$21

CLAYTON E. WHIPPLE

A survey of man's occupation and utilization of the earth. Important occupations of mankind such as industry, forestry, fishing, are studied as developed in the major geographic regions of the world. An important element is a survey of the major agricultural regions of the world and the part geographic environment has played in their development. The effects of geography on world trade and population are also considered in terms of the present dynamic world situation and the immediate post-war period.

*614. Economic Geography of Europe (2) Spring

CLAYTON E. WHIPPLE

POLITICAL SCIENCE AND HISTORY

603. The British Empire in Peace and War (2)

Tu 6-8. \$14

ALBERT VITON

The course will review the development of political and economic forces within the British Empire and Commonwealth of Nations, analyzing effects on the international status of the various parts of the Empire, and on their relations with Britain. Special emphasis will be placed on economic, social and political policies of Britain since the outbreak of the war, organization of the Empire for prosecution of total war and effect of recent economic and political developments on the future of the British Empire.

(See Regional Studies for related courses.)

607. Problems of International Organization (2)

W 6-8. \$14

ALBERT VITON

After a brief survey of the rise of the modern national state system and the conflict in Western thought between nationalism and internationalism, the League of Nations and the other international institutions established at the end

(1 American University course. See A.U. catalog.)

of the last war, attention will be focused on the chief political, social, and economic problems which will confront the victorious democracies at the end of the war. Special emphasis will be placed on the problems of the Pacific and Asia. The problems of immediate relief and reconstruction of conquered and occupied areas, and methods now being devised in Britain, the United States, and by exiled governments for dealing with those problems. Contemporary theories of federal union and reconstruction of the League of Nations. The problem of control of national military forces; theories of international military organizations. The nature of the colonial problem, its significance and the possible solutions now being devised. Problems of surplus population, international trade, raw materials and industrialization of "backward" areas. The problem of international security, arbitration of disputes and world economic social planning. Minority and imperialist problems of the Near East. The place of Soviet Russia in the new order in the Pacific, its policies and influence on the peace settlement, and future relations with America. The new balance of power in the Pacific and the role of the United States.

608. World Politics (2)

Tu 6-8. \$14

WESLEY M. GEWEHR

A survey of world affairs and international relations. Such topics will be considered as the origins of the World War of 1914-18, the Versailles Conference and the treaties that brought no peace; revolution in Germany and Russia; the conditions that gave rise to Mussolini and Hitler; the nature of Nazism, Fascism and Communism; the breakdown of the peace machinery; the war; basic issues in the Far Eastern situation; problems and prospects of Pan-Americanism.

670. Latin American History (2 each semester)

F 6-8. \$14

ERNESTO GALARZA

The lectures and discussions will deal with the main periods of the evolution of Latin America, stressing the social and economic aspects of change. The aim of the course will be to give a broad background which will enable the student better and more clearly to interpret the role of the twenty American Republics in contemporary world affairs.

691. Pressure Groups in Government (2)

W 6-8. \$14

JASPER B. SHANNON

The nature, causes, organization, and activities of various large pressure groups including business, labor, and agricultural bodies. The impact of pressure groups upon the legislative and administrative processes. The significance of pressure groups for the future of American governmental organization and for democratic government in general.

[339.] Recent American History

WESLEY M. GEWEHR

[601.] Problems of Nationalism in the East and the West (2)

R. V. GOGATE

[813.] Contemporary Political Thought (2)

ALBERT VITON

[332.] The Department of Agriculture—Its Origin, Structure and Functions (2)

T. SWANN HARDING

Social and Economic History of American Agriculture
(*See Agricultural Economics 580*)

Principles of International Law¹

Tu 8:20-10:30. \$30

PITMAN POTTER

See all Public Administration courses.

PSYCHOLOGY

342. The Conditions of Personality Growth (2)

W 7-9. \$12

DWIGHT H. CHAPMAN

This course treats the principal factors influencing personality development: physiological bases, infantile and childhood experiences, and cultural determinants. It considers both experimental and clinical contributions to the theory of personality and the application of those to practical problems of interpreting and dealing with people.

736. Techniques of Interviewing and Questionnaire Construction

Tu 7-9. \$14

RENSIS LIKERT

Study of the theory and practice of interviewing and questionnaire construction with special emphasis on investigation of attitudes as used in public attitude research. Consideration is given to various interviewing methods, including interviewing as applied to personnel work and counseling, and to principles of questionnaire construction. Emphasis is laid on practical field procedures and problems.

822. Social Psychology (2) Spring

CARL C. TAYLOR and EDGAR A. SCHULER

[830.] Rural Social Psychology

CARL C. TAYLOR

PUBLIC LAW

Administrative Law and Procedure

(*See Public Administration 617*)

Organized Labor and the Law

(*See Labor Economics 595*)

Legal Aspects of Investigation—Criminal Evidence and Procedure

(*See Public Administration 663*)

Business Law¹ (3)

Tu 6:10-8:20. \$30

WALTER YOUNG

⁽¹ American University course. *See A.U. catalog.*)

[] Not given 1944-45.

REGIONAL STUDIES

These regional orientation courses cut across traditional academic lines. They are designed to give students: (1) a basic knowledge of the region involved, the pattern of anthropological, economic, geographical, historical, political, and social factors which have gone into the development of the region and play important roles in its life today; (2) the "feel" of the region—the customs, religions, folkways, prejudices, and other aspects of life in the countries included. These factors are discussed in practical terms as they are reflected in today's problems in the region. Also discussed are the prospective situations of the countries in the region during the post-war period.

The regions listed are not mutually exclusive in all cases, and in some instances emphasis is on particular countries within the region or on certain aspects of life within those countries. In such cases this fact is noted in the course description.

These courses will be useful to those who plan to engage in relief and reconstruction work during or after the war, as well as to others whose work in this country touches at some point on the regions covered. Under each course, reference is made to related language courses. It is suggested that students refer also to other courses of a related nature (such as Post-War Economic Problems, International Organization, War and Post-War Food Policy, World Politics, Comparative World Agriculture, Economic Geography of Europe, etc.), particularly in this department, and to courses offering training in specialized professional fields.

598. The Orient (2)

Tu 6-8. \$14

R. V. GOGATE

An introductory course dealing with the historical and cultural background of the principal nations of the Orient and presenting facts and issues for the study of contemporary problems of the oriental peoples. Japan, China, India and the Moslem nations will be especially considered. Conditions arising from present war situations will be discussed with a view to understanding the basic changes that have taken place in the lives of peoples in these regions. Up-to-date information on South Asiatic regions and their economic future in the shaping of post-war policies and loyalties will be emphasized.

(See also *Chinese, Hindustani, Japanese.*)

600. Contemporary Russia (2)

Th 7-9. \$14

VALERY J. TERESHTENKO

Beginning with a brief summary of political, social, and cultural life in Imperial Russia, this course will place major emphasis upon Russia since the Revolution. The survey will include description of Russia's natural resources, and an analysis of Soviet planned economy in relation to agriculture, industry, transportation, and distribution. Some treatment will be accorded the cultural and geographic regions of Russia with a final discussion of the role of the U.S.S.R. in World War II.

602. The Southwest Pacific (2) Spring

I-MIEN TSIANG

*(See also Chinese, Dutch, Malay.)***609. The Far East (2) Spring**

WESLEY M. GEWEHR

*(See also Chinese, Japanese.)***605. The Philippines (2 each semester)**

M 6-8. \$14

LEOPOLDO T. RUIZ

With special attention to cultural influences of India, China, Japan, and Arabia; to the place of Latin culture in Filipino folkways and mores; to cultural ties between the Philippines and the United States.

*(See also Spanish.)***606. Social Problems of the Philippines in the Post-War Period (2)**

F 6-8. \$14

LEOPOLDO T. RUIZ

A study of social problems likely to prevail in the Philippines at the close of the present war. A survey will be undertaken of the socio-economic problems during the American regime such as those arising from agricultural land utilization, farm tenancy, trade and commerce, and the Philippine independence movement. The socio-economic planning of the Philippine Commonwealth and its bearing on the post-war period including proposed solutions such as the cooperative system and government-owned corporations will be discussed. The American democratic policy as a factor in group awareness to the adverse social and economic conditions will be stressed throughout the course.

599. The Balkans and Near East (3)

Tu 6-9. \$21

CLAYTON E. WHIPPLE and AFIF TANNOUS

A political and socio-economic survey. Special emphasis on rural and agricultural problems, agricultural rehabilitation, and indicated solutions.

*(See Arabic, French, Czech, Russian.)***669. Japan (2) Spring**

JOSEPH G. YOSHIOKA

*(See also Japanese.)***[814.] Latin America (2 each semester)**

CARL C. TAYLOR, C. P. LOOMIS, and T. L. SMITH

*(See also Portuguese, Spanish.)***La America Latina y los Estados Unidos***(See Sociology 611)***The British Empire in Peace and War***(See Political Science and History 603)*

[] Not given 1944-45.

SOCIOLOGY

611. La America Latina y los Estados Unidos (2 each semester)

M 8-10. \$14

PHILIP L. GREEN

Lectures and discussions in Spanish.

This course provides an opportunity to achieve greater facility in Spanish, while acquiring useful and interesting information on the life of the Latin-American countries and their relations with the United States.

The first semester analyzes racial, geographic, economic, and political forces that have shaped Latin-American developments; and surveys important contributions of Latin-American literature, art, music, social legislation and other spheres of human activity. The second semester embraces fundamental trends and influences for and against inter-American friendship, from earliest times to the present day. It describes official and non-governmental inter-American relations, presents problems and indicates opportunities facing the Americas today. Registration is limited to students who have had the requisite instruction and practice in Spanish. Those who are in doubt as to their adequacy in this regard are advised to confer with the instructor before registering.

***815. The Cultural Regions of the United States (3)**

W 6-9. \$21

CARL C. TAYLOR

This course is a study of the cultural regions of the United States covering in detail the characteristics of the various regions and subregions and their inter-relationships, including settlement patterns, social organizations and institutions, prevailing ideologies, modes and folkways, and dominant attitudes and opinions of the people who live in the rural areas of these cultural regions.

***817. Rural Community Organization (3)**

M 6-8 and additional hour of special assignment each week. \$21

DOUGLAS ENSMINGER

This course provides an opportunity for those interested in the general field of social organization to analyze the techniques communities have used in organizing their local forces to deal with such problems as food production, soil conservation, health, education, recreation, and religion. Consideration will be given to methods and techniques employed by Federal and State agencies in securing participation of the local communities in their respective programs. Regional variations and similarities in social structure will be considered.

[816.] The Evolution of American Rural Life

CARL C. TAYLOR

[818.] Rural Population Trends

CONRAD TAEUBER

[819.] Contemporary Social Theory

C. P. LOOMIS

Sampling in Social and Economic Surveys*(See Mathematics and Statistics 732)***Social Security Problems, Past and Present¹ (3)**

W 6:10-8:20. \$30

OSCAR WEIGERT

¹American University course. See A.U. catalog.)

[] Not given 1944-45.

TRANSPORTATION AND TRAFFIC

337. Principles of Transportation (3)

Tu 6-9. \$18. Repeated in Spring

HAMILTON K. SNELL

Characteristics and economic principles of railway, highway, waterway, and air transportation. Transportation geography and principal commodity movements of the United States. Freight and passenger rate principles. Varieties of competition, cooperation, consolidation, coordination. Transportation labor relations and financial problems. Interstate Commerce Act; principles of interstate and intra-state regulation of railway, highway, waterway, and air transportation. Sources and interpretation of transportation data and information, particularly for Government employees.

655. Freight Tariff Construction and Interpretation (3)

M 6-9. \$21

G. LLOYD WILSON

A course in the principles of tariff construction and interpretation. The principal types of tariffs published by rail, water, pipe-line, motor and freight forwarder tariffs are studied with respect to arrangement of tariff data, the tariff rules of the Interstate Commerce Commission and Civil Aeronautics Board, and the interpretation and application of the tariffs to the solution of rate problems.

The course is a problems and laboratory study of the practical use of tariffs of all types in the principal freight traffic territories of the United States.

615. Freight Rates (3) Spring

G. LLOYD WILSON and V. I. GRUBER

806. Wartime Transportation Problems (2)

W 6-8. \$14

SIDNEY L. MILLER

This course is designed to give an insight into major problems now faced by the industry, with emphasis upon trends and controls. After a brief survey of the development of the various agencies of transport, with emphasis upon developments since 1920, a study will be made of particular problems. Among these will be competition, coordination, consolidation, labor, and finance. Regulation will be examined and the work of the Interstate Commerce Commission and Civil Aeronautics Board scrutinized; stress will here be placed upon evolution of policies and trends. Consideration will be given to domestic transport in war, including the record of the Office of Defense Transportation. Finally, various proposals urged as partial or complete "solutions" of the Nation's transportation problem will be weighed and possible courses of action suggested.

826. Traffic Management (3) Spring

G. LLOYD WILSON

828. Problems of Commercial Air Transportation (3)

Th 6-9. \$21

G. LLOYD WILSON

A course in the organization, services, charges and regulation of domestic and international air transportation. The course includes the study of the development of aviation and air transportation, air mail, express, cargo and passenger traffic and charges; the aid and development of commercial air transportation; government regulation of air carriers; foreign air carriers and regulation; and international air-lines and their aid by national governments and the problems of international regulation.

[820.] Seminar on International Aviation

[821.] International Air Transportation

CHARLES D. BROWN

Basic Problems of Transportation and Communication¹ (3)

F 6:10-8:20. \$30

LUDWIG M. HOMBERGER

(¹American University course. See A.U. catalog.)

[] Not given 1944-45.

Faculty

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